5-4610-205-35

TM 5-4610-205-35

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

FIELD AND DEPOT MAINTENANCE MANUAL

WATER PURIFICATION UNIT

BASE MOUNTED; ELECTRIC DRIVE, AC 120/208 VOLT, SINGLE PHASE AND 3 PHASE, 60 CYCLE; 3000 GALLONS PER HOUR

(MET-PRO MODEL 3000-2700A)

FSN 4610-857-0330

HEADQUARTERS, DEPARTMENT OF THE ARMY
AUGUST 1963

D 101.11:

READEX FICHE best copy available

SAFETY PRECAUTIONS

Make sure that all electrical power has been disconnected from the control cabinet before performing maintenance on the water purification unit electrical system.

TECHNICAL MANUAL
No. 5–4610–205–35

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *23 August 1963*

FIELD AND DEPOT MAINTENANCE MANUAL

WATER PURIFICATION UNIT: BASE MOUNTED; ELECTRIC DRIVEN, AC, 120/208-VOLT, SINGLE PHASE AND 3-PHASE, 60-CYCLE; 3,000 GALLONS PER HOUR (MET-PRO MODEL 3000–2700A) FSN 4610–857–0330

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. These instructions are published for the use of field and depot maintenance personnel maintaining the Met-Pro Model 3000–2700A Water Purification Unit. They provide information on the maintenance of the equipment which is beyond the scope of the tools, equipment, personnel, or supplies normally available to using organizations.

b. Appendix I contains a list of publications applicable to this manual. The maintenance allocation chart is located in TM 5–4610–205–20.

c. Numbers in parentheses on illustrations indicate quantity.

d. Report all deficiencies in this manual on DA Form 2028. Submit recommendations for changes, additions, or deletions to the Commanding Officer, U.S. Army Mobility Support Center, ATTN: SMOMS–MM, P. O. Box 119, Columbus, Ohio 43216. Direct communication is authorized.

e. Report unsatisfactory equipment performance and suggestions for equipment improvement as specified in TM 38–750.

2. Record and Report Forms

For record and report forms applicable to field and depot maintenance, refer to TM 38–750.

Section II. DESCRIPTION AND DATA

3. Description

A general description of the water purification unit, the location and description of the identification and instruction plates, and information on the difference in models are contained in TM 5–4610–205–10. A more detailed description of the components is contained in TM 5–4610–205–20. The repair and maintenance instructions are described in appropriate sections of this manual.

4. Tabulated Data

a. Agitator Drive Motor.

Make	Kingston and Conley
Model	40A545211
Stator:	
Number of poles	4
Number of slots	36
Number of coils	36
Coil span	7 teeth
Number of coils	9
Turns per coil	22
Wire size	21, one strand
Type of wire	Triple formvar
Winding connection diagram.	WYE, Poles in series
Insulation materials	Class A
Dipping compounds, include fungus treatment.	Oil modified phenolic varnish (Class F).
Dipping and baking procedure.	Immersion
Resistance values of coil groups.	STD Hipot 2,250 volts for 20 sec.

b. Filter Pump Motors.

Make	Doerr Electric
Model	62755CY
Stator:	
Number of poles	4
Number of slots	24
Number of coils	24
Coil span	7 teeth
Number of coils	3
Turns per coil	31
Wire size	1–21, 1–22
Type of wire	Heavy formvar
Winding connection diagram.	A 2067
Insulation materials	Class A
Dipping compounds, include fungus treatment.	MIL–V–1137 type M, grade CB

Dipping and baking procedure.	Give 2 impregnating coats of MIL–V–1137 type M, Grade CB.
Resistance values of coil groups.	1.5, line to line

c. Wiring Diagram.

Figure 1. Schematic wiring diagram.
(Located in back of manual)

d. Time Standards. Table I lists the number of man-hours required under normal conditions to perform the indicated maintenance and repair for the water purification unit. Components are listed under the appropriate functional index. The times listed are not intended to be rigid standards. Under adverse conditions, the operations will take longer; but under ideal conditions with highly skilled mechanics, most of the operations can be accomplished in cinsiderably less time.

Table I. Time Standards, Lubrication and Service

	Hours
51 WATER PURIFICATION SYSTEMS	
5102 TANKS, CONTAINERS	
Feeder assembly, slurry	0.5
Feeder assembly, chemical	0.5
Filter housing	0.4
Filter elements	2.0
Tanks, chemical solution	0.4
Tank, diatomite dilution	0.4
Tank, waste water	0.4
Tank assembly, erdlator	0.6
5103 PIPING VALVES	
Ejector assembly, slurry	0.2
Sight glass	0.2
Valve, plug	0.1
5109 MULTIPLE TAKEOFF	
Reducer, speed	0.3
Chain tightener assembly	0.1
Slip clutch assembly	0.1
Bearing unit, pillow block	0.1
Clutch assembly	0.1

Table II. Time Standards, Removal and Replace

	Hours
15 FRAME	
1501 FRAME ASSEMBLY	
Base assembly, erdlator	8.0
Base assembly, filter	6.0
Frame, chemical feeder	4.0
Frame assembly, filter	4.0
17 BODY; CAB; HOOD; HULL	
1708 STOWAGE RACKS, BOXES, STRAPS	
Box assembly, stowage	0.2
Frame and strap assembly, stowage box	0.4
22 MISCELLANEOUS CHASSIS OR HULL, AND ACCESSORY ITEMS	
2210 DATA PLATES	
Data plates	0.5
Plate, C.O.E.	0.5

Table II. Time Standards, Removal and Replace —Continued

	Hours
26 ACCESSORIES	
2602 ACCESSORIES	
Cables, power	1.0
Hose, suction	0.2
Hose, pressure	0.4
40 ELECTRIC MOTORS	
4000 MOTOR	
Motor, ac, slurry feeder	1.0
Motor, ac, chemical feeder	3.0
Motor, ac, agitator drive	1.0
Motor, ac, filter pump	1.2
4001 ROTOR ASSEMBLIES	
Rotor assembly, ac (Motor removed)	2.0
4002 STATOR ASSEMBLIES	
Stator, field ring	2.5
4004 VENTILATING SYSTEM	
Fan, ventilating	0.3
4005 FRAME SUPPORT AND HOUSING	
Base, sliding, agitator motor	0.8
4006 STARTING AND PROTECTING DEVICES	
Starter, motor	0.5
4007 DRIVE COMPONENTS	
Pulley, grooved	0.5
Belt, V	0.8
V-belt, slurry drive (includes adjustment)	0.5
4709 CONTROL PANEL, HOUSING	
Cabinet assembly, control	8.0
Harness, wiring	6.0
4011 FUSE AND FUSE HOLDERS	
Fuse	0.1
Fuse holder	0.3
4012 SWITCHES	
Switch	0.5
4018 TERMINAL BLOCKS, JUNCTION BOXES	
Board, terminal	2.0
Receptacle, power	0.5
Bar, bus	1.0
42 ELECTRICAL EQUIPMENT	
4209 SIGNALING DEVICES	
ringing	1.0
4216 FORMED CABLE ASSEMBLIES	
Cable assembly, power	1.0
47 GAGES	
4702 GAGES	
Gage, pressure, dial indicating	0.5
4705 FLOWMETERS AND REGULATORS	
Meter, gph, indicating	0.5
51 WATER PURIFICATION SYSTEM	
5102 TANKS, CONTAINERS	
Feeder assembly, slurry	4.5
Feeder assembly, chemical	2.0
Body, pump, diaphragm	1.0

Table II. Time Standards, Removal and Replace —Continued

		Hours
	Plastic window	1.0
	Latch, door	4.0
	Packing, bearing	0.1
	Agitator assembly	5.0
	Tank, diatomite	8.0
	Tank, erdlator	16.5
	Tank, waste water	0.6
	Filter housing	3.0
	Rod, effluent launder	0.8
	Rail, bridge	1.5
5103	PIPING, VALVES	
	Valves, gate, globe, check	2.0
	Valve, float	2.0
	Valve, plug, port	2.0
	Sight glass	0.2
	Hose, rubber and plastic	0.5
	Valve assembly, air release	2.0
	Piping, erdlator	6.0
	Piping, filter	4.0

Table II. Time Standards, Removal and Replace —Continued

		Hours
5109	MULTIPLE TAKEOFF	
	Reducer, speed	2.0
	Bearing unit, pillow block	0.7
	Belt, V, drive	0.8
	Shaft, agitator drive	1.0
	Clutch assembly	1.2
	Pulley, groove	0.5
	Sprocket, chain	0.5
	Tightener, chain	0.6
	Chain, roller	0.5
55	PUMPS	
5500	PUMP ASSEMBLY	
	Filter	1.0
	Head, suction	2.0
5501	SHAFTS, ROTORS IMPELLERS	
	Impeller, pump	2.5
	Seal and shaft	2.5

CHAPTER 2

GENERAL MAINTENANCE INSTRUCTIONS

Section I. SPECIAL TOOLS AND EQUIPMENT

5. Special Tools and Equipment

No special tools or equipment are required by field and depot personnel to perform maintenance on the water purification unit.

6. Field and Depot Maintenance Repair Parts

Field and Depot Maintenance Repair Parts are listed and illustrated in TM 5–4610–205–35P.

7. Specially Designed Tools and Equipment

No specially designed tools or equipment are required by field and depot personnel to perform maintenance on the water purification unit.

Section II. TROUBLESHOOTING

8. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the water purification unit or any of its components. Each trouble symptom stated is followed by a list of probable causes of trouble. The possible remedy recommended is described opposite the probable cause.

9. Agitator Operation Noisy or Too Slow

Probable cause	*Possible remedy*
Bent agitator shaft	Replace shaft (par. 31).
Bent agitator disk	Replace disk (par. 31).
Agitator shaft bearings worn or broken.	Replace bearings (pars. 29 and 32).
Downcomer tube bent	Repair or replace downcomer tube (par. 31).

10. Motor Contactor Inoperative

Probable cause	*Possible remedy*
Contacts burnt or corroded	Replace contact set (par. 22).
Contact springs weak or defective.	Replace contact set (par. 22).
Overload relay defective	Replace relay (par. 22).
Coil defective	Replace coil (par. 22).

11. Raw Water Flow Indicator Shows Incorrect Reading

Probable cause	*Possible remedy*
Bellows dirty or defective	Clean or replace bellows (par. 28).
Flow indicator out of adjustment.	Adjust the flow indicator (par. 28).

12. Raw Water Flow Indicator Pointer Stays on Zero

Probable cause	*Possible remedy*
Pointer dragging against scale plate.	Adjust scale plate (par. 28).
Calibration adjustment incorrect	Adjust calibration (par. 28).
Bellows defective	Replace bellows (par. 28).

13. Raw Water Flow Indicator Pointer Will Not Indicate Zero

Probable cause	*Possible remedy*
Axis of bellows not horizontal.	Reset pointer (par. 28).

14. Speed Reduces Bind or Run Noisy

Probable cause	*Possible remedy*
Gears defective	Replace gears (pars. 26 and 35).
Bearings defective	Replace bearings (pars. 26 and 35).
Shaft bent	Replace shaft (pars. 26 and 35).
Housing cracked or worn	Replace housing (pars. 26 and 35).

15. Slurry Feeder Binds or Runs Noisy

Probable cause	*Possible remedy*
Shaft defective	Replace shaft (par. 37).

Probable cause	*Possible remedy*
Bearings defective	Replace bearings (par. 37).
Housing cracked or worn	Replace housing (par. 37).
Agitators bent	Replace agitators (par. 37).

16. Solution Feeder Will Not Run or Runs Noisy

Probable cause	*Possible remedy*
Gears worn or broken	Replace gears (par. 36).
Bearings or sleeves defective.	Replace bearings and sleeves (par. 36).
Shaft defective	Replace shaft (par. 36).
Defective receptacle connector.	Replace receptacle connector (par. 36).
Motor defective	Repair or replace motor (par. 36).

17. Air Release Valve Fails To Release or Releases Too Slow

Probable cause	*Possible remedy*
Push rod bent or corroded	Replace push rod (par. 44).
Check valve clogged or defective.	Clean or replace valve (par. 44).

18. Air Release Valve Will Not Hold Pressure

Probable cause	*Possible remedy*
Diaphragm defective	Replace diaphragm (par. 44).

19. Filter Pump Will Not Run or Runs Noisy

Probable cause	*Possible remedy*
Rotor shaft defective	Replace rotor (par. 46).
Motor defective	Repair or replace motor (par. 47).
Bearings defective	Replace bearings (par. 46).
Impeller defective	Replace impeller (par. 46).

20. Flow Controller Valve Leaks or Flow Is Incorrect

Probable cause	*Possible remedy*
Diaphragm defective	Replace diaphragm (par. 43).
Spring defective	Replace spring (par. 43).
Valve seat worn	Replace seat (par. 43).
Valve worn or clogged	Clean or replace valve (par. 43).
Orifice clogged or defective	Clean or replace orifice (par. 43).

CHAPTER 3

WATER TREATMENT SECTION MAINTENANCE INSTRUCTIONS

Section I. CONTROL CABINET

21. General

This section contains maintenance information for the control cabinet and motor contactors. A line voltage type motor contactor connects each motor winding to the control cabinet at full voltage. The contacts are equipped with two current sensitive relays connected in series with the motor windings to provide overload protection.

Warning: **Make sure that all electrical power has been disconnected from the control cabinet before performing maintenance on the water purification unit electrical system.**

22. Motor Contactors and Overload Relays

a. Removal. Remove the motor contactors and overload relays TM 5–4610–205–20.

b. Disassembly. Refer to figure 2 and disassemble the motor contactors and overload relays.

c. Cleaning, Inspection, and Repair.

(1) Clean all parts with a cloth dampened in an approved cleaning solvent and blow dry with compressed air, if available.

(2) Inspect all parts for cracks, breaks, and wear.

(3) Inspect the contacts for burning, pitting, and corrosion.

(4) Inspect springs for weakened condition and distortion.

(5) Inspect the coil for damage and evidence of being overheated.

(6) Replace all defective parts.

d. Reassembly. Refer to figure 2 and reassemble the motor contactor and overload relays.

e. Installation. Install the motor contactors and overload relays TM 5–4610–205–20.

23. Control Cabinet

a. Removal.

(1) Remove the power cable from the control cabinet TM 5-4610–205–10.

(2) Refer to figure 3 and remove the control cabinet.

b. Disassembly. Remove the ammeter and voltmeter, alarm silence switch, buzzer, and transformer, stop and start switch mounting bracket, motor contactors, terminal board and terminal block, stop and start buttons, fuse holder and receptacle connectors, low water alarm light, and control cabinet door latches TM 5–4610–205–20.

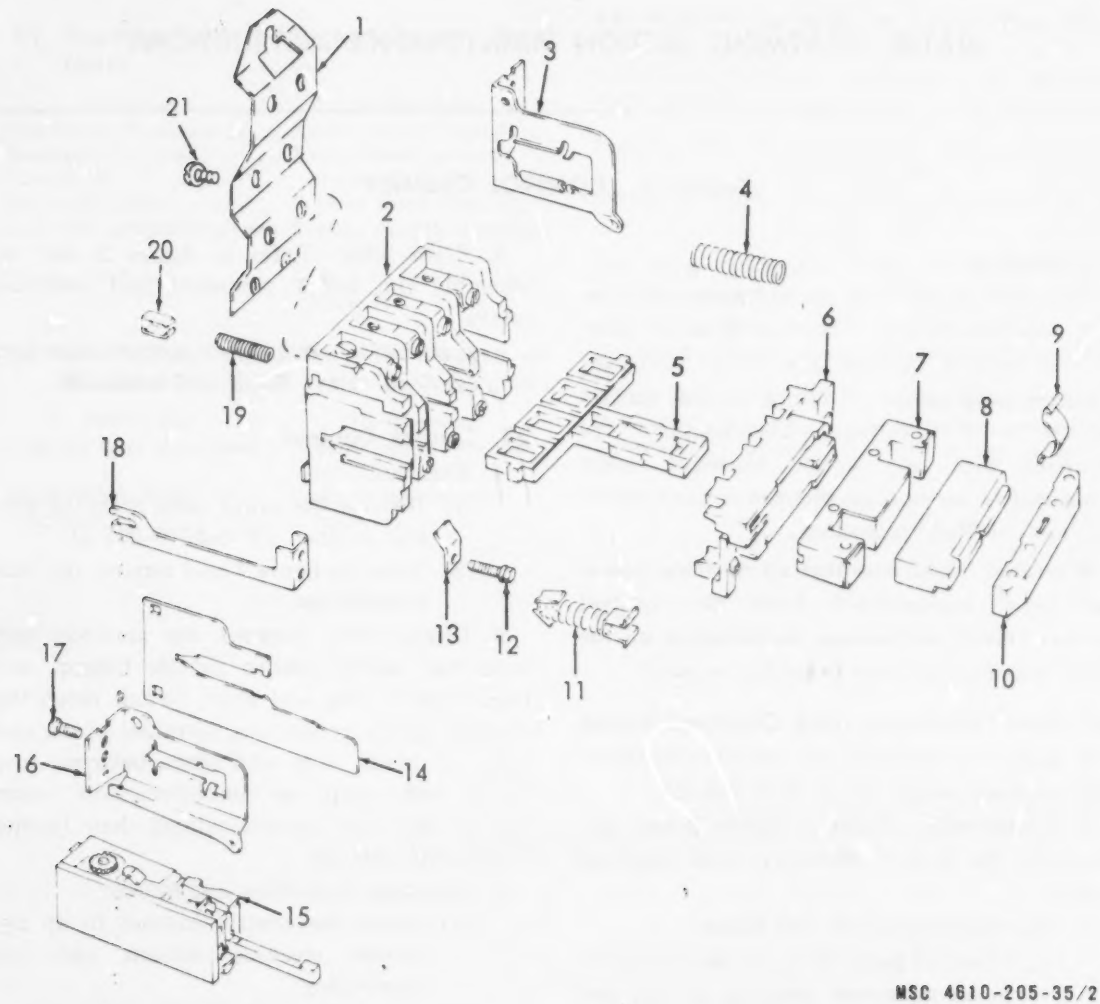
c. Cleaning, Inspection, and Repair.

(1) Wash the control cabinet in an approved cleaning solvent and dry thoroughly.

(2) Inspect the control cabinet for cracks, breaks, dents, and other damage.

(3) Repair or replace the control cabinet as necessary.

d. Reassembly. Install the control cabinet door latches, low water alarm light, fuse holder and receptacle connectors, stop and start buttons, terminal board and terminal block, motor contactors, stop and start switch mounting bracket, alarm silence switch, buzzer, and transformer, and ammeter and voltmeter TM 5–4610–205–20.



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1 Contactor mounting support
2 Contact block
3 Right side mounting bracket
4 Spring
5 Operating arm
6 Contact cover
7 Armature
8 Coil
9 Spring clip
10 Armature frame
11 Movable contact (4 rqr)
12 Stationary contact mounting screw (8 rqr)
13 Stationary contact (4 rqr)
14 Insulation (2 rqr)
15 Overload relay (2 rqr)
16 Left hand mounting bracket
17 Screw, machine, No. 6–32 x ⅜ in. (2 rqr)
18 Coil retainer
19 Spring (2 rqr)
20 Spring guide (2 rqr)
21 Screw, machine, No. 6–32 x ¼ in. (2 rqr)

Figure 2. Motor contactor and overload relay, disassembly and reassembly.

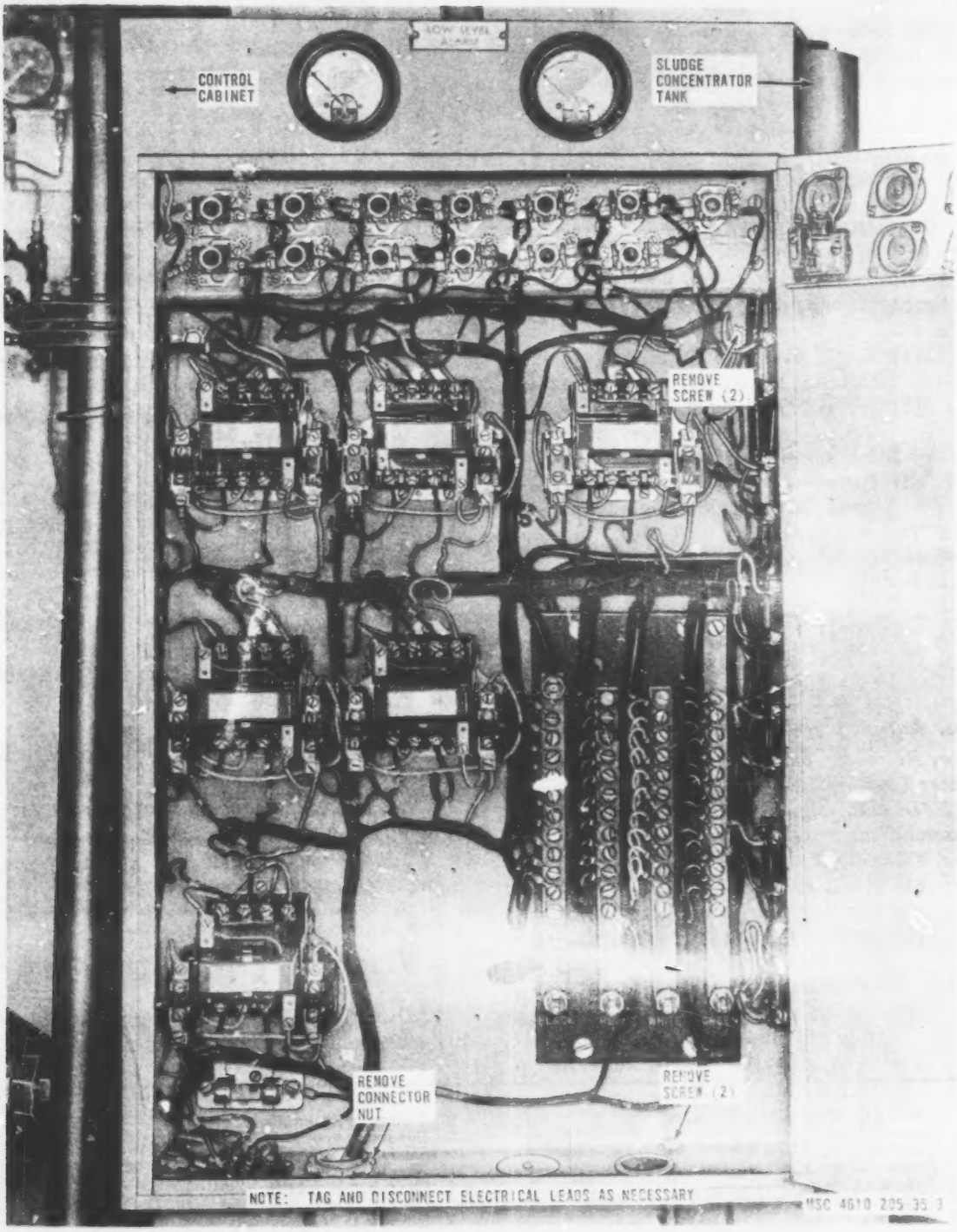

Figure 3. Control cabinet, removal and installation.

Section II. ERDLATOR TANK AND COMPONENTS

24. General

This section contains maintenance information on the erdlator tank and those components necessary for operation of the erdlator tank.

25. Conduit

a. Removal.

(1) Remove the drive motor receptacle connectors TM 5–4610–205–20.

(2) Refer to figure 4 and remove the conduit.

b. Disassembly. Refer to figure 5 and disassemble the conduit.

c. Cleaning, Inspection, and Repair.

(1) Wash the conduit in an approved cleaning solvent and dry thoroughly.

(2) Inspect for cracks, breaks, damaged threads, and rough edges that might damage wiring insulation.

(3) Remove all rough edges with a file or stone. Replace all defective conduit.

d. Reassembly. Refer to figure 5 and reassemble the conduit.

e. Installation.

(1) Refer to figure 4 and install the conduit.

(2) Install the drive motor receptacle connectors TM 5–4610–205–20.

26. Agitator Speed Reducer

a. Removal. Remove the agitator speed reducer TM 5–4610–205–20.

b. Disassembly. Refer to figure 6 and disassemble the agitator speed reducer.

c. Cleaning, Inspection, and Repair.

(1) Wash all metal parts in an approved cleaning solvent and dry thoroughly.

(2) Inspect the input and output shaft seals for wear, deterioration, and bent or distorted casings.

(3) Inspect the bearings for wear, pitting, and binding.

(4) Inspect the gear for cracked, broken, or worn teeth.

(5) Inspect the shaft for wear, cracks, distortion, and worn or damaged keyways.

(6) Inspect the housing and other parts for cracks, breaks, and wear.

(7) Replace all defective parts.

d. Reassembly. Refer to figure 6 and reassemble the agitator speed reducer.

e. Installation. Install the agitator speed reducer TM 5–4610–205–20.

27. Agitator Drive Motor

a. Removal. Remove the agitator drive motor TM 5–4610–205–20.

b. Disassembly. Refer to figure 7 and disassemble the agitator drive motor.

c. Cleaning and Inspection.

(1) Wipe the motor clean with a cloth dampened in an approved cleaning solvent and dry thoroughly.

(2) Inspect for cracks, breaks, wear, and damaged wiring insulation.

(3) Inspect the bearings for wear, pitting, and binding.

(4) Inspect the rotor shaft for wear, distortion, and other defects.

(5) Replace all defective parts.

d. Testing. Refer to TM 5–764 for testing of the drive motor.

e. Reassembly. Refer to figure 7 and reassemble the agitator drive motor.

f. Installation. Install the agitator drive motor TM 5–4610–205–20.

28. Raw Water Flow Indicator

a. Removal. Remove the raw water flow indicator TM 5–4610–205–20.

b. Disassembly. Refer to figures 8 and 9 and disassemble the raw water flow indicator.

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1 Cable connector
2 Conduit box
3 Conduit, 1¼ x 16 in.
4 Elbow and cover
5 Nipple, conduit, 1¼ x 1 in.
6 Nipple, conduit, 1¼ x 4½ in.
7 Coupling, conduit, 1¼ in. (3 rqr)
8 Connector, conduit
9 Conduit, 1¼ x 12 in.
10 Elbow, 45°, 1¼ in. (2 rqr)
11 Nipple, conduit, 1¼ x 4½ in.
12 Conduit, 1¼ x 14 in.
13 Conduit, 1¼ x 15 in.
14 Elbow, conduit, 90°, 1¼ x 15 in.

Figure 4. Conduit, removal and installation.

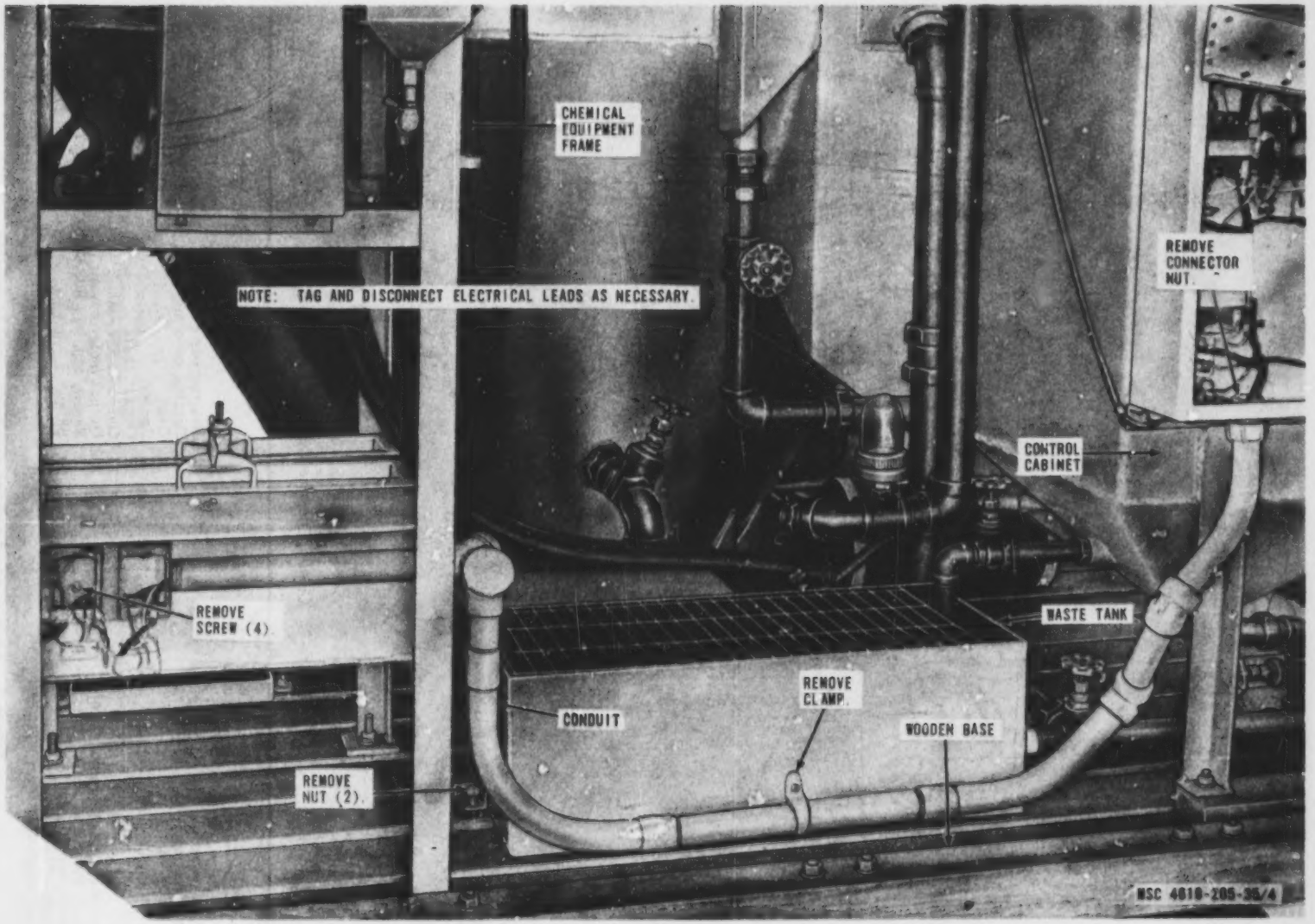

Figure 4.—Continued

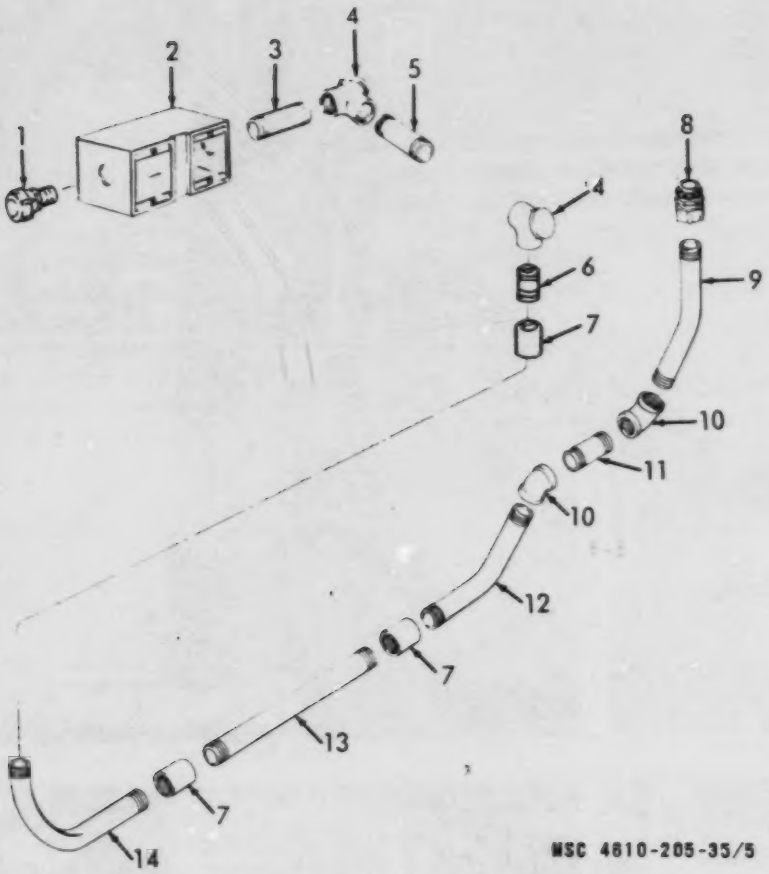

Figure 5. Conduit, disassembly and reassembly.

1 Input cover
2 Shim (2 rqr)
3 Shim (2 rqr)
4 Bearing cup (2 rqr)
5 Housing
6 Cap
7 Bearing cone and roller (2 rqr)
8 Input worm and shaft
9 Screw, cap, hex-hd, No. 10–24 x ½ in. (8 rqr)
10 Cover
11 Input shaft seal
12 Bearing cup (2 rqr)
13 Bearing cone and roller
14 Gear
15 Spacer
16 Output shaft
17 Output shaft seal
18 Output flange cover
19 Screw, cap, hex hd, ¼–20 x ⅝ in. (4 rqr)
20 Shim
21 Key, machine, 3/16–1⅞ in.

Figure 6. Agitator speed reducer, disassembly and reassembly.

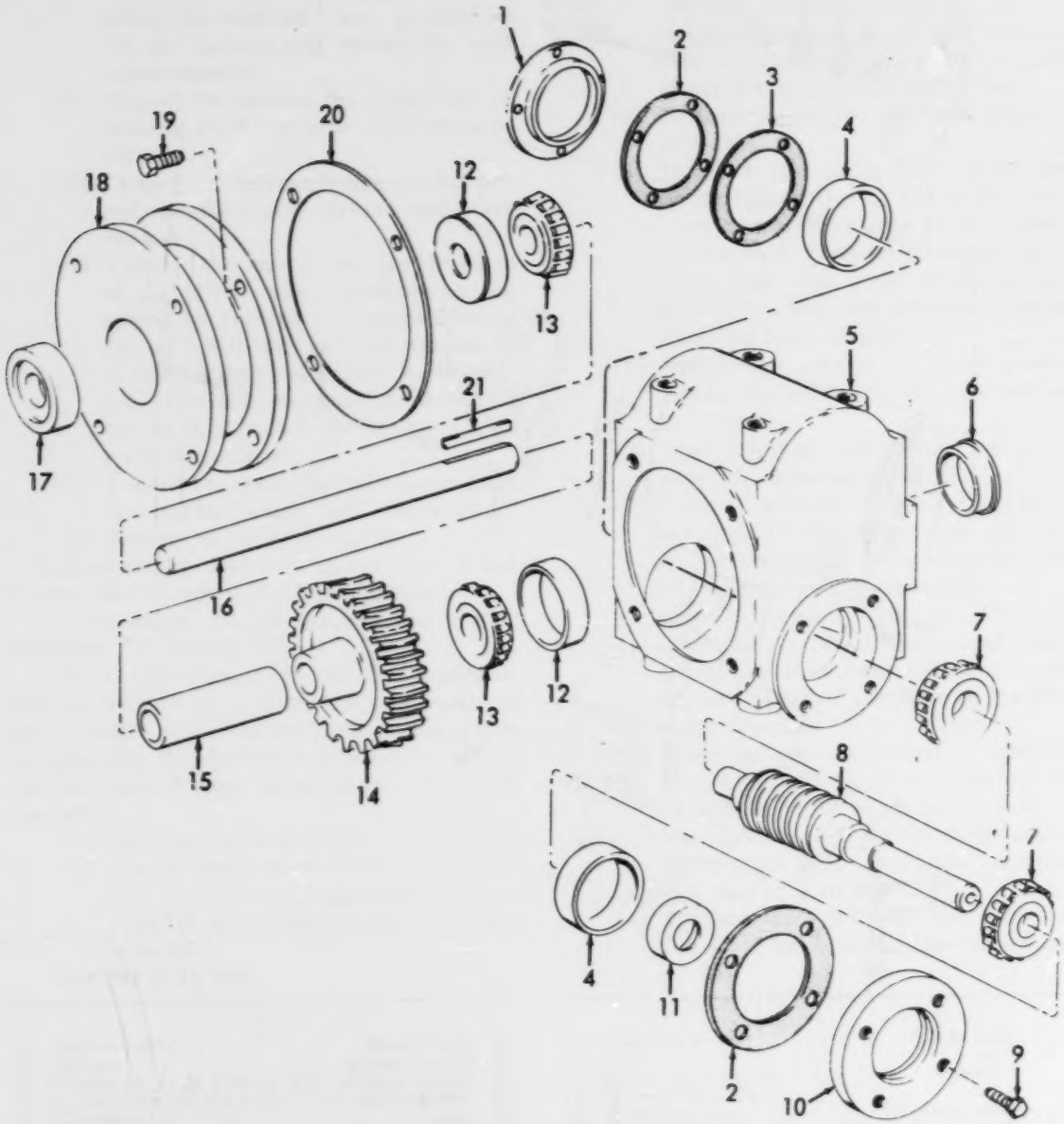

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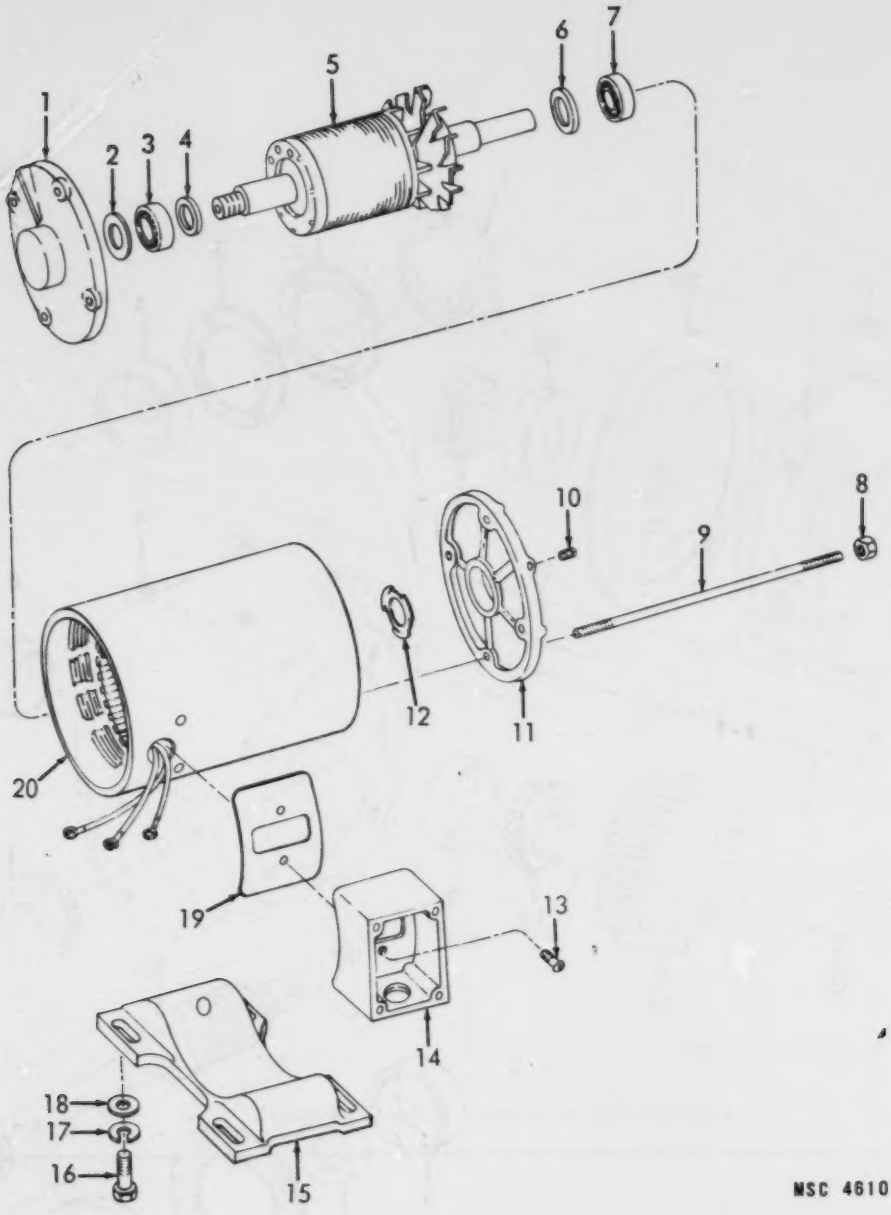
Figure 6—Continued.



1 Front shield
2 Shim
3 Bearing
4 Shim
5 Rotor assembly
6 Shim
7 Bearing
8 Nut, hex, No. 10–24 (8 rqr)
9 Thru bolt (4 rqr)
10 Plug, ¼–20 x ¼ in. (2 rqr)
11 Rear shield
12 Thrust spring
13 Screw, machine, No. 10–32 x ⅝ in. (2 rqr)
14 Junction box
15 Base
16 Screw, cap, hex-hd, 5/16–18 x ⅞ in. (2 rqr)
17 Washer, lock, 5/16 in. (2 rqr)
18 Washer, flat, ⅜ in. (2 rqr)
19 Gasket
20 Stator

Figure 7. Agitator drive motor, disassembly and reassembly.

c. Cleaning and Inspection.

(1) Clean the bellows with a soft brush and an approved cleaning solvent. Clean all other parts with a cloth dampened in an approved cleaning solvent. Dry all parts thoroughly.

***Caution:* Exercise care when handling the bellows. Any perforation of the bellows will render the unit unserviceable.**

(2) Inspect the bellows for holes, bent or missing mounting pins, and damaged threads.

(3) Inspect the bellows heads and mounting case for cracks, breaks, and other damage.

(4) Inspect the movement for freedom of operation. Apply pressure on the spring by turning the pointer pin as far as it will turn and then release it. If the pin does not return to its original position, a weak or defective spring is indicated and the movement must be replaced.

(5) Inspect the scale plate and cover glass for cracks, breaks, and discoloration.

(6) Replace all defective parts.

d. Reassembly. Refer to figures 8 and 9 and reassemble the raw water flow indicator.

e. Installation. Install the raw water flow indicator TM 5–4610–205- .0.

f. Zero Adjustment. If the flow indicator will not indicate zero, open both vent cocks. If the indicator still does not indicate zero, it is an indication that bellows axis is not horizontal and the pointer must be set on the zero mark manually.

(1) Remove the cover glass as in *b* above.

(2) Use a small screwdriver and rotate the pointer zero adjustment screw (fig. 10) as necessary until the pointer is on zero.

(3) Install the cover glass as in *b* above.

g. Calibration.

(1) Install the flow indicator on a test stand similar to that show by figure 11. Connect the high-pressure side of the flow indicator to an air supply which can be controlled by a manually operated reducing regulator and accurately measured by a water manometer or other basic standard. Install an air release valve in the air line.

(2) Remove the pointer and scale plate as in *b* above.

(3) Install a test scale plate (with the center removed) (fig. 10) on the indicator to permit access to all adjustment points. Make sure the zero, midpoint, and full scale locations are clearly marked and accurately positioned on the scale plate.

(4) Install the pointer as in *b* above. Adjust the pointer to indicate zero as in *f* above.

(5) Open the vent cock on the low pressure side of the indicator.

(6) With no pressure applied to the indicator, set the movement arm (fig. 10) so the segment is in the same position in relation to the movement cover plate as shown in figure 10. This will allow for a small amount of back travel of the segment with the major amount of travel available in the forward direction.

(7) Open the manual reducir gulator (fig. 11) until there is a reading of 24 pounds on the air gage and a read ing of 75 inches on the manometer. The pointer (fig. 10) should now indicate the full scale mark.

(8) If the pointer indicates less than the full scale mark, rotate the calibration

---

1 Bellows unit
2 Gasket
3 Case
4 Screw, machine, No. 6–32 x 7/16 in. (6 rqr)
5 Movement
6 Zero eccentric stem
7 Zero eccentric support
8 Screw, machine, No. 4–40 x 3/16 in. (2 rqr)
9 Snubber
10 Pointer
11 Scale plate
12 Arm
13 Screw, machine, No. 4–40 x ¼ in.
14 Washer, lock, No. 4
15 Retaining ring
16 Glass cover
17 Gasket
18 Gasket ring
19 Retaining ring

Figure 8. Raw water flow indicator, disassembly and reassembly.

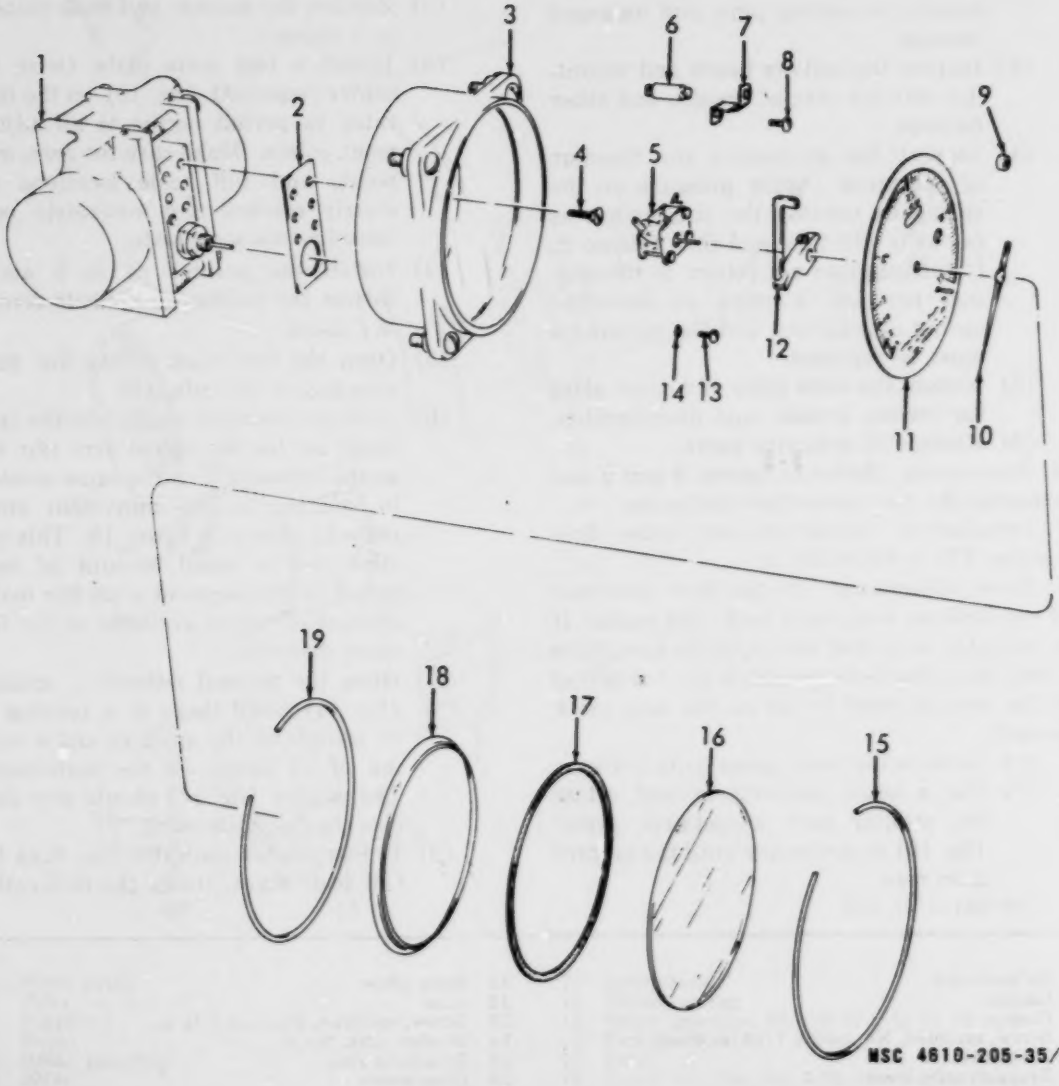
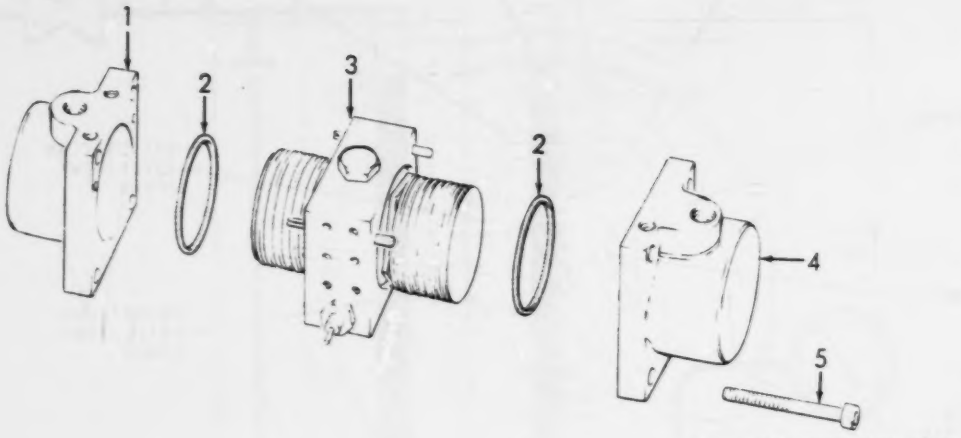


Figure 8—Continued.



1 Head
2 Preformed packing (2 rqr)
3 Bellows
4 Head
5 Screw, cap, ¼–28 x ¼ in. (4 rqr)

Figure 8. Bellows unit, disassembly and reassembly.

adjustment screw clockwise. If the pointer indicates more than the full scale mark, rotate the adjustment screw counterclockwise.

(9) Release the air pressure to allow the pointer to return to zero. Readjust the pointer if it does not return to exactly zero as in *f* above.

(10) Apply full pressure to the indicator and readjust if necessary. Release the air.

(11) Reapply air pressure so there is a reading of 12 pounds on the air gage (fig. 11) and a reading of 37.5 inches on the manometer. The pointer (fig. 19) should now be setting at midpoint between zero and full scale.

(12) If the pointer is below midpoint, insert a screwdriver in the lower slot of the movement arm at the linearity adjustment point and spread the slot. If the pointer is higher than the midpoint, spread the upper slot.

Note. Linearity adjustment will effect the entire calibration. After making the adjustment, repeat steps 5 through 10.

(13) After the accuracy of calibration has been achieved, remove the pointer and test scale plate. Remove the flow indicator from the test stand, and install the pointer and glass cover as in *b* above.

29. Agitator Upper Shaft Bearing

a. Removal.

(1) Remove the agitator speed reducer mounting brackets TM 5–4610–205–20.

(2) Refer to figure 12 and remove the agitator upper shaft bearing.

b. Cleaning and Inspection.

(1) Wash the bearing in an approved cleaning solvent and blow out with compressed air, if available.

(2) Inspect the bearing for cracks, breaks, and evidence of binding.

(3) Replace a defective bearing.

c. Installation.

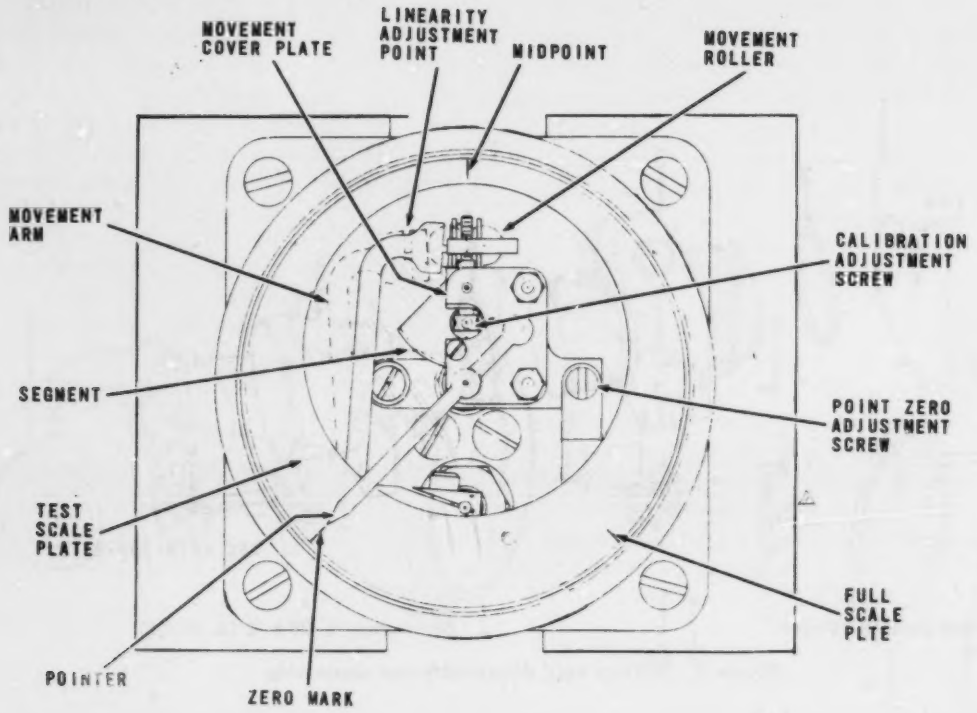


Figure 10. Raw water flow indicator, adjustment points.

(1) Refer to figure 12 and install the agitator upper shaft bearing.
(2) Install the agitator speed reducer mounting brackets TM 5–4610–205–20.

30. Bridge Rails and Influent Launders

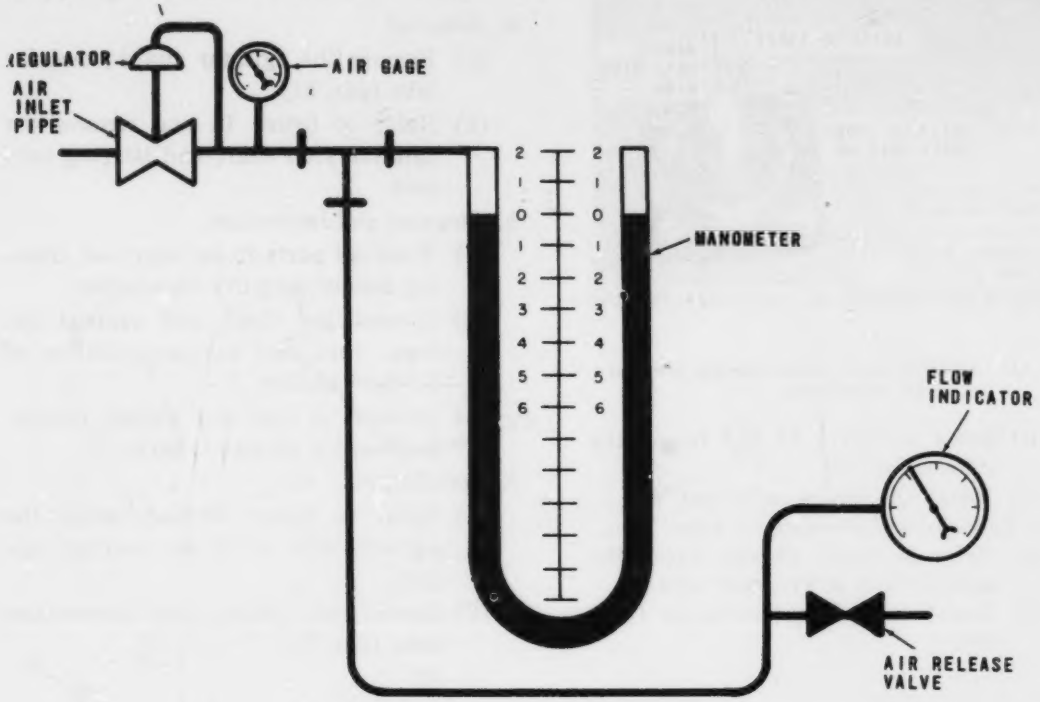
a. Removal.
(1) Remove the drive motor base assembly, effluent launder leveling rods and tube, agitator drive shaft and bearings, raw water aspirator manifold, TM 5–4610–205–20.
(2) Remove the agitator upper shaft bearing (par. 29).
(3) Refer to figure 13 and remove the bridge rails and influent launders.

b. Disassembly. Refer to figure 14 and disassemble the bridge rails.

c. Cleaning, Inspection, and Repair.
(1) Wash all parts in an approved cleaning solvent and dry thoroughly.
(2) Inspect for cracks, breaks, and distortion.
(3) Repair or replace all damaged or defective parts as necessary.

d. Reassembly. Refer to figure 14 and reassemble the bridge rails.

e. Installation.
(1) Refer to figure 13 and install the bridge rails and influent launders.
(2) Install the effluent launder leveling rods and connecting tube, raw water aspirator manifold, agitator drive shaft and bearings and drive motor base assembly, TM 5–4610–205–20.
(3) Install the agitator upper shaft bearings (par. 29).



AIR GAGE READING	MANOMETER READING IN INCHES OF WATER	SCALE READING
0	0	0
12	37.5	MID POINT
24	75	FULL SCALE

MSC 4810-205-35/11

Figure 11. Raw water flow indicator, typical test installation.

31. Agitator, Downcomer Tube, and Effluent Launder

a. Removal.

(1) *Agitator and downcomer tube.*

(*a*) Remove the influent launders (par. 30).

(*b*) Refer to figure 13 and remove the agitator and downcomer tube.

(2) *Effluent launder.*

(*a*) Remove the bridge rails (par. 30).

(*b*) Refer to figure 13 and remove the effluent launder.

b. Disassembly. Refer to figure 15 and disassemble the agitator.

c. Cleaning, Inspection, and Repair.

(1) Wash all parts in an approved cleaning solvent and dry thoroughly.

(2) Inspect for cracks, breaks, bends, wear, and distortion.

(3) Repair or replace all damaged or defective parts.

d. Reassembly. Refer to figure 15 and reassemble the agitator.

e. Installation.

(1) *Effluent launder.*

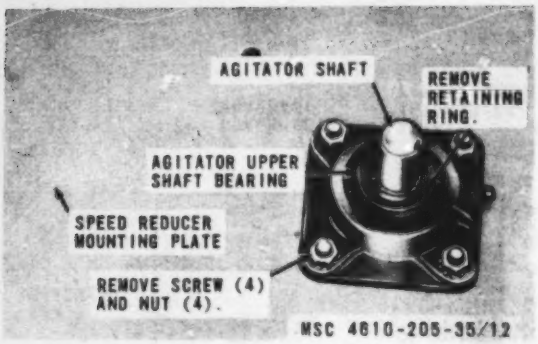


Figure 12. Agitator upper shaft bearing, removal and installation.

(*a*) Refer to figure 13 and install the effluent launder.

(*b*) Install the bridge rails (par. 30).

(2) *Agitator and downcomer tube.*

(*a*) Refer to figure 13 and install the agitator and downcomer tube.

(*b*) Install the influent launders (par. 30).

32. Agitator Stub Shaft and Bearing Support

a. Removal.

(1) Remove the agitator and downcomer tube (par. 31).

(2) Refer to figure 16 and remove the agitator stub shaft and bearing support.

b. Cleaning and Inspection.

(1) Wash all parts in an approved cleaning solvent and dry thoroughly.

(2) Inspect the shaft and support for wear, rust, and the accumulation of foreign matter.

(3) Remove all rust and foreign matter. Replace all defective parts.

c. Installation.

(1) Refer to figure 16 and install the agitator stub shaft and bearing support.

(2) Install the agitator and downcomer tube (par. 31).

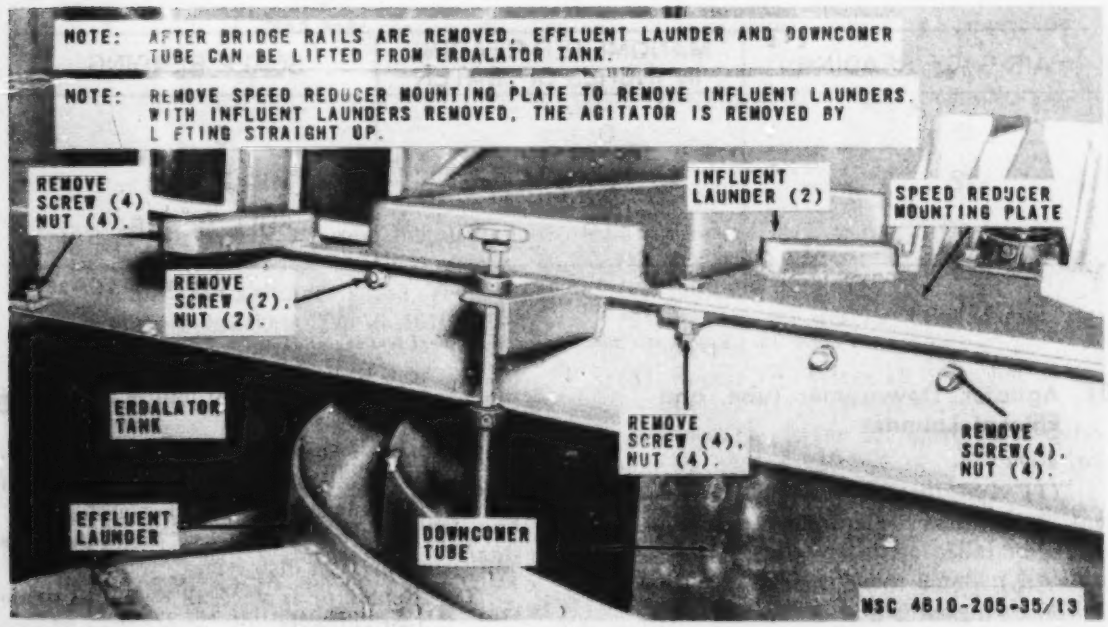
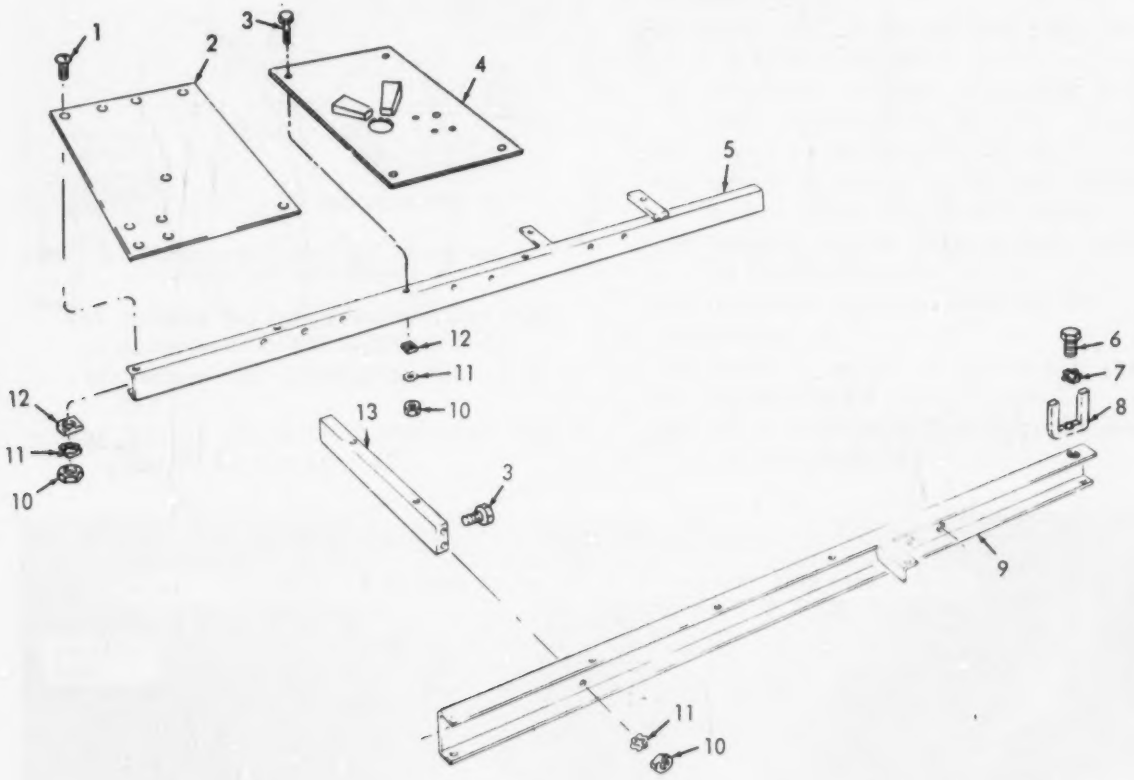

NOTE: AFTER BRIDGE RAILS ARE REMOVED, EFFLUENT LAUNDER AND DOWNCOMER TUBE CAN BE LIFTED FROM ERDALATOR TANK.
NOTE: REMOVE SPEED REDUCER MOUNTING PLATE TO REMOVE INFLUENT LAUNDERS. WITH INFLUENT LAUNDERS REMOVED, THE AGITATOR IS REMOVED BY LIFTING STRAIGHT UP.
REMOVE SCREW (4) NUT (4).
INFLUENT LAUNDER (2)
SPEED REDUCER MOUNTING PLATE
REMOVE SCREW (2), NUT (2).
ERDALATOR TANK
REMOVE SCREW (4), NUT (4).
REMOVE SCREW(4), NUT (4).
EFFLUENT LAUNDER
DOWNCOMER TUBE
MSC 4810-205-35/13

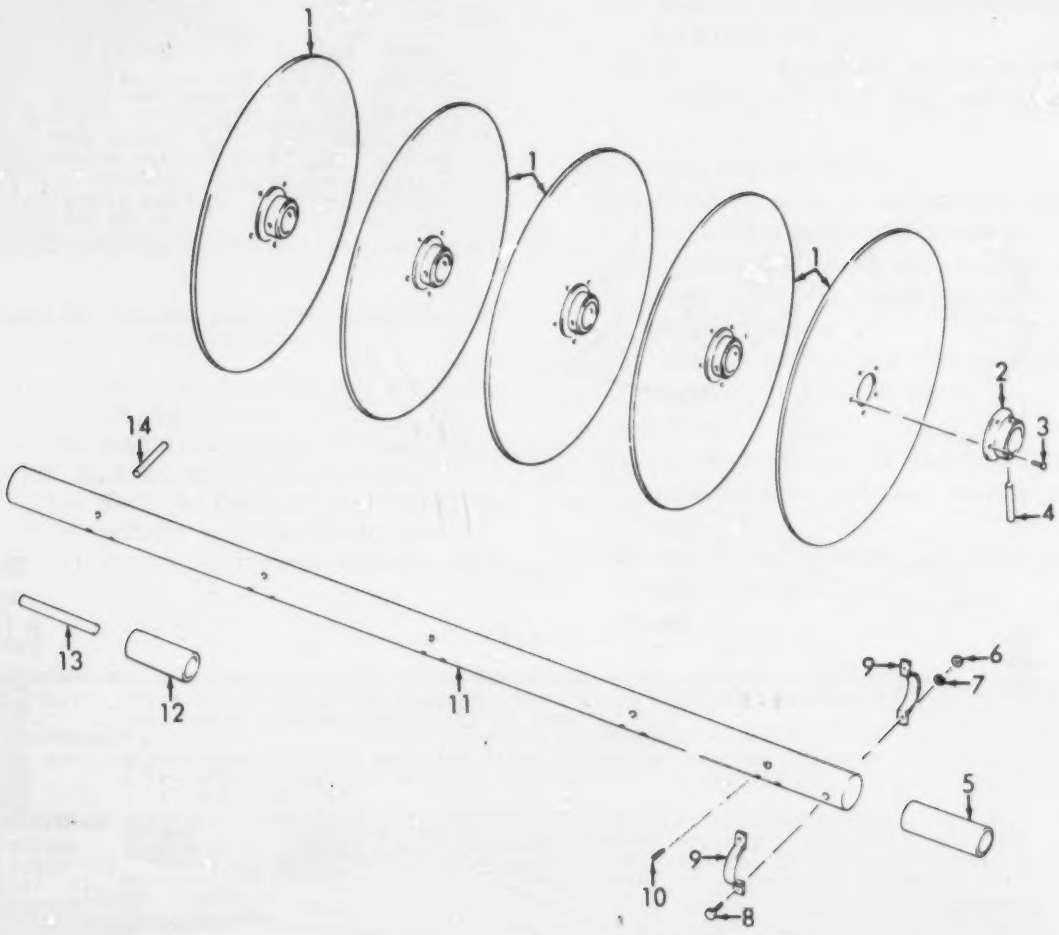
Figure 13. Bridge rails, influent launders, agitator, downcomer, tube, and effluent launder, removal and installation.



MSC 4610-205-35/14

1 Screw, cap, hex-hd, ⅜–16 x 1¾ in. (5 rqr)
2 Motor mounting plate
3 Screw, cap, hex-hd, ⅜–16 x 1¼ in. (8 rqr)
4 Speed reducer mounting plate
5 Left hand bridge rail
6 Screw, machine, No. 10–28 x ⅝ in. (3 rqr)
7 Washer, lock, IET, No. 10 (3 rqr)
8 Hose clip (3 rqr)
9 Right hand bridge rail
10 Nut, hex, ⅜–16 (9 rqr)
11 Washer, lock, IET, ⅜ in. (9 rqr)
12 Bevel washer (9 rqr)
13 Bridge rail support

Figure 14. Bridge rails, disassembly and reassembly.



EMC 4610-203-35/68

1 Agitator disk (5 rqr)
2 Agitator disk hub (5 rqr)
3 Rivet, aluminum ⅛ x ¾ in. (40 rqr)
4 Pin, headless, aluminum, ¼ x 3 in. (10 rqr)
5 Agitator shaft sleeve bearing
6 Nut, hex, ¼–20 (2 rqr)
7 Washer, lock, ¼ in. (2 rqr)
8 Screw, cap, hex-hd, ¼–20 x ¾ in. (2 rqr)
9 Shaft clamp (2 rqr)
10 Setscrew, ⅛–32 x ½ in.
11 Agitator shaft
12 Bushing
13 Upper shaft
14 Pin, aluminum ¼ x 2½ in. (2 rqr)

Figure 15. Agitator, disassembly and reassembly.

33. Erdlator Tank

a. Removal.

(1) Remove or disconnect all piping and hoses as necessary from the erdlator tank TM 5–4610–205–20.

(2) Refer to figure 17 and remove the erdlator tank.

b. Disassembly.

(1) Remove the control cabinet (par. 23).

(2) Remove all piping from the erdlator tank TM 5–4610–205–20.

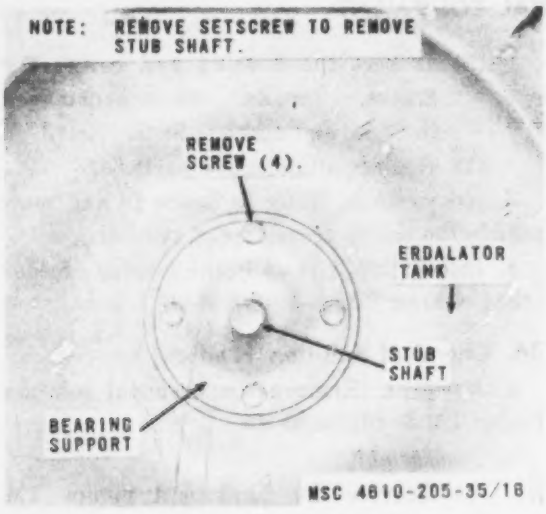


Figure 16. Agitator stub shaft and bearing support, removal and installation.

(3) Remove the sludge concentrator tank control valves TM 5–4610–205–20.
(4) Remove the downcomer tube (par. 31).
(5) Remove the agitator stub shaft and bearing support (par. 32).
(6) Remove the raw water flow indicator TM 5–4610–205–20.

c. Cleaning and Inspection.
(1) Clean the erdlator tank with an approved cleaning solvent and a stiff bristle brush.
(2) Inspect for cracks, breaks, dents, and other damage.
(3) Replace a defective erdlator tank.

d. Reassembly.
(1) Install the raw water flow indicator TM 5–4610–205–20.
(2) Install the agitator stub shaft and bearing support (par. 32).
(3) Install the downcomer tube (par. 31).
(4) Install the sludge concentrator tank control valves TM 5–4610–205–20.
(5) Install all piping on the erdlator tank TM 5–4610–205–20.
(6) Install the control cabinet (par. 23).

e. Installation.
(1) Refer to figure 17 and install the erdlator tank.
(2) Install or connect all piping and hoses TM 5–4610–205–20.

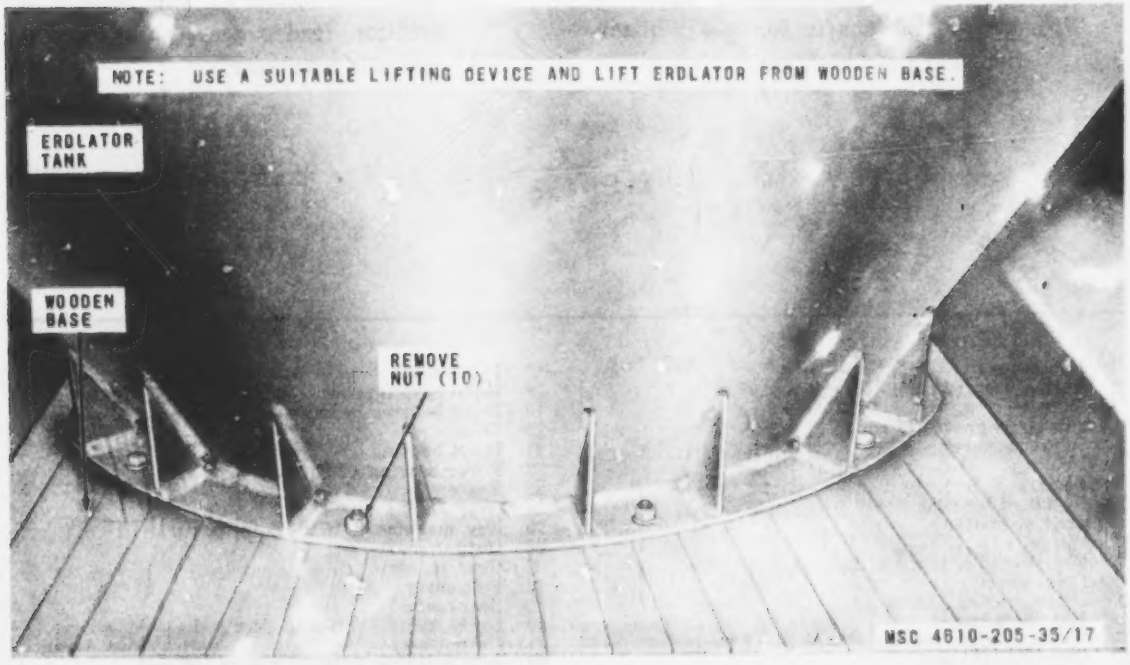

NOTE: USE A SUITABLE LIFTING DEVICE AND LIFT ERDLATOR FROM WOODEN BASE.
ERDLATOR TANK
WOODEN BASE
REMOVE NUT (10)
MSC 4610-205-35/17

Figure 17. Erdlator tank, removal and installation.

Section III. CHEMICAL EQUIPMENT

34. General

This section covers the water purification unit chemical feed equipment. The chemical feed equipment consists of the slurry feeder speed reducer and drive motor, solution feeder, slurry feeder, and chemical equipment frame.

35. Slurry Feeder Speed Reducer

a. Removal. Remove the slurry feeder speed reducer TM 5–4610–205–20.

b. Disassembly. Refer to figure 18 and disassemble the slurry feeder speed reducer.

c. Cleaning, Inspection, and Repair.

(1) Wash all metal parts in an approved cleaning solvent and blow dry with compressed air, if available.

(2) Inspect the input and output shaft seals for wear, deterioration, and cracks.

(3) Inspect the bearings for wear, pitting, and binding.

(4) Inspect the gear for wear, cracked or broken teeth, and worn keyways.

(5) Inspect the shafts for wear, distortion, and worn keyways.

(6) Inspect the housing and covers for cracks, breaks, wear, damaged threads, and other defects.

(7) Replace all defective parts.

d. Reassembly. Refer to figure 18 and reassemble the slurry feeder speed reducer.

e. Installation. Install the slurry feeder speed reducer TM 5–4610–205–20.

36. Chemical Solution Feeder

a. Removal. Remove the chemical solution feeder TM 5–4610–205–20.

b. Disassembly.

(1) Remove the diaphragm pumps TM 5–4610–205–20.

(2) Refer to figure 19 and remove the solution feeder drive arms.

(3) Refer to figure 20 and remove the solution feeder lever arms and push rods.

(4) Refer to figure 21 and remove the solution feeder cover.

(5) Refer to figure 22 and remove the solution feeder gear, shaft, and receptacle connector.

---

1 End cover
2 Bearing cup (2 rqr)
3 Shim
4 Side cover gasket (2 rqr)
5 Solid side cover
6 Housing
7 Locknut
8 Outboard bearing
9 Bearing spacer
10 Worm
11 Key, machine, ⅛ x 1⅜ in.
12 Input shaft
13 Input adapter gasket
14 Bearing adapter
15 Screw, cap, hex-hd, ¼–20 x ¾ in. (4 rqr)
16 Plain encased seal
17 Input cover
18 Input cover gasket
19 Input bearing locknut
20 Shim
21 Input bearing
22 Roller bearing (2 rqr)
23 Spacer
24 Gear
25 Key, machine, 3/16 x 1⅜ in. (2 rqr)
26 Output shaft
27 Gear spacer
28 Side cover
29 Seal cover
30 Screw, machine, No. 10–24 x ½ in.
31 Output seal
32 Bolt, machine, 5/16–18 x ¾ in. (8 rqr)

Figure 18. Slurry feeder speed reducer, disassembly and reassembly.

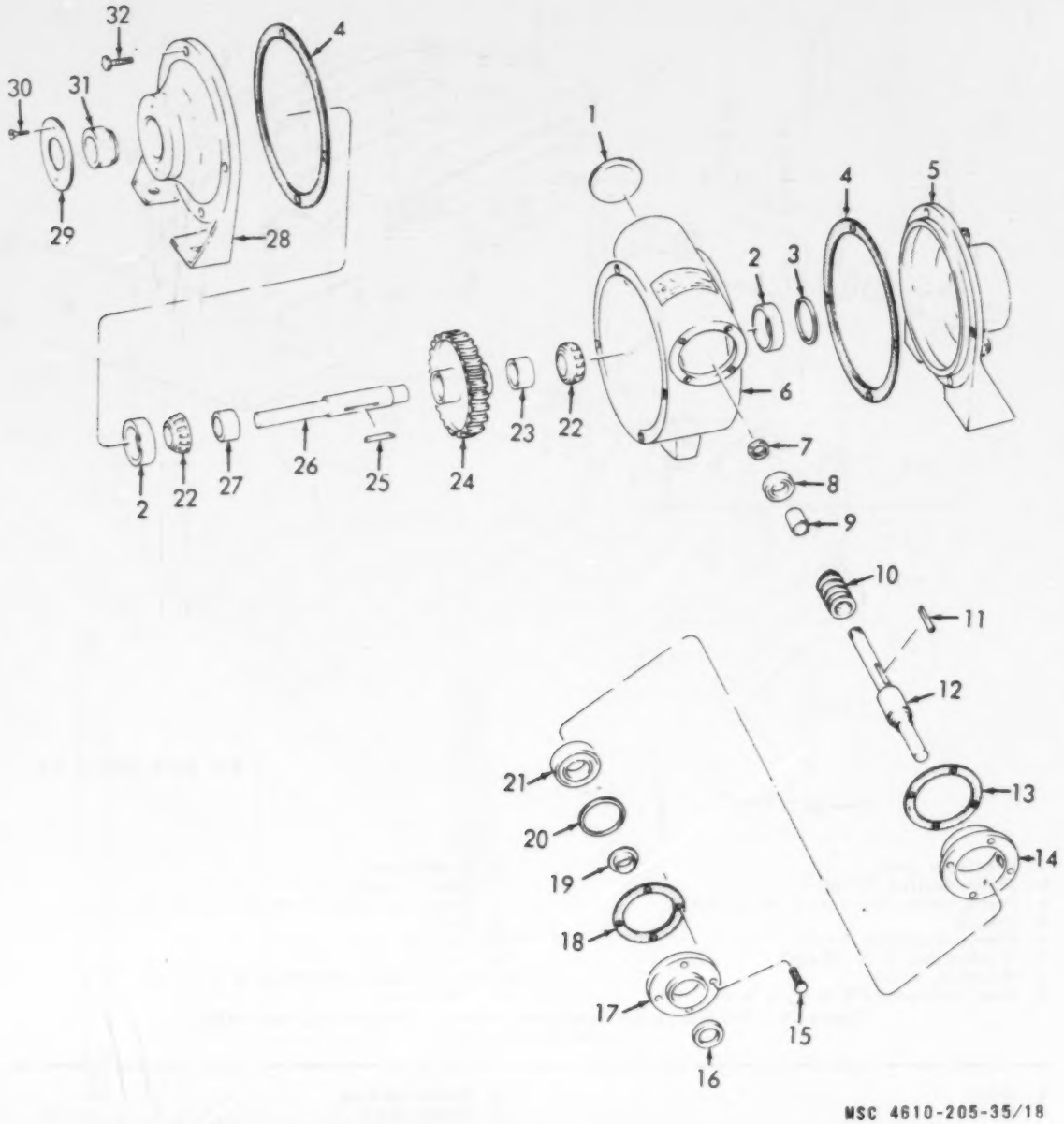
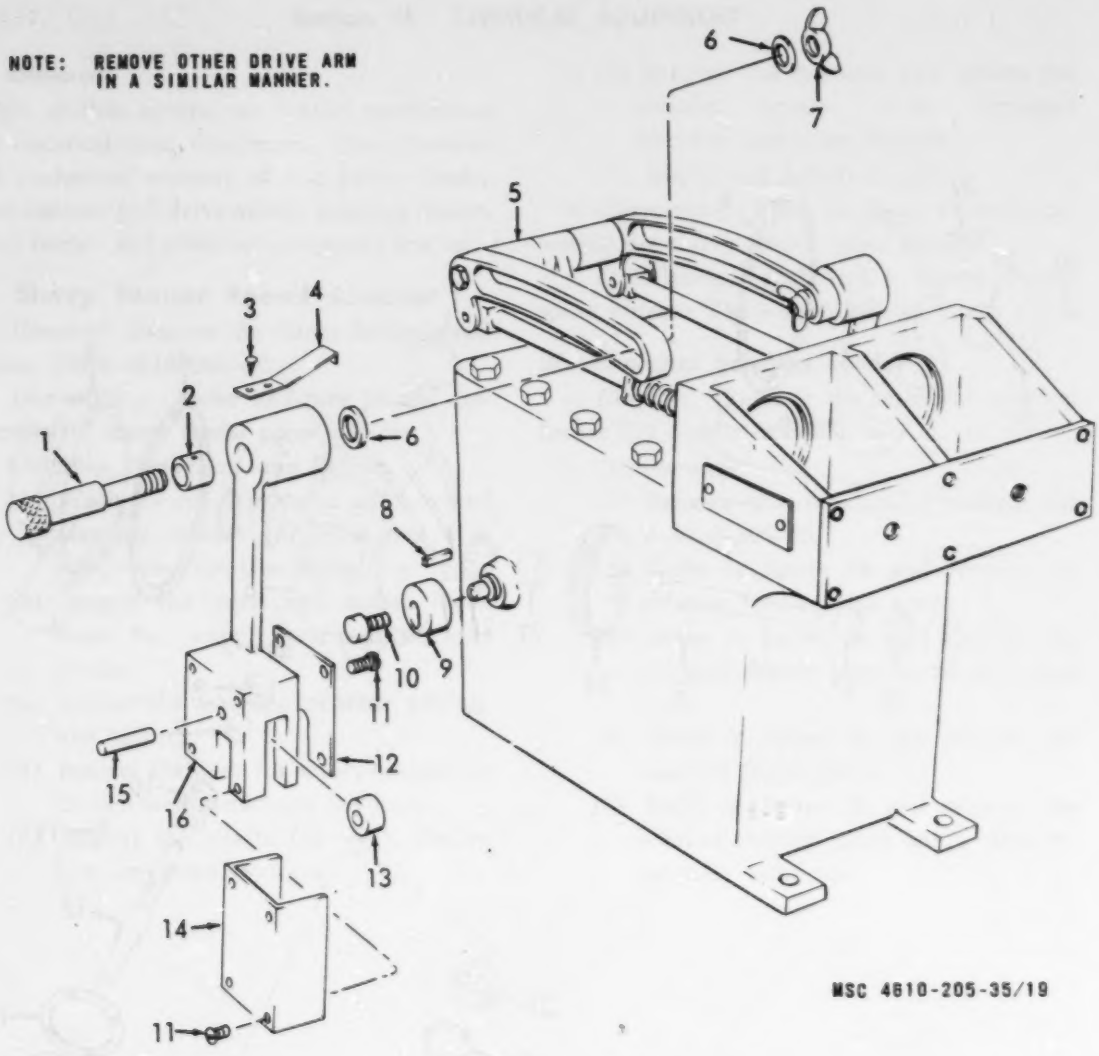


Figure 18—Continued.



1 Positioner shaft
2 Sleeve bearing (2 rqr)
3 Screw, drive, No. 4 x ¼ in. (2 rqr)
4 Pointer
5 Chemical solution feeder
6 Washer, flat, ⅜ in. (2 rqr)
7 Wingnut, ⅜–16
8 Key, machine, 0.125 in. sq. x ⅝ in.
9 Feeder cam
10 Cam follower
11 Screw, machine, No. 6–32 x ¼ in. (8 rqr)
12 Plate
13 Bearing
14 Cover
15 Pin, straight, headless, ¼ x 1⅜ in.
16 Drive arm

Figure 19. Solution feeder drive arms, removal, disassembly, reassembly, and installation.

1 Scale
2 Bracket
3 Lever arm
4 Solution feeder
5 Washer, special
6 Screw, machine, No. 6–32 x ¼ in. (4 rqr)
7 Spring
8 Washer, flat, 7/16 in.
9 Retaining ring
10 Hinge block
11 Pin, straight, headless, 0.122 x ⅝ in.
12 Sleeve bearing
13 Push rod
14 Retaining ring
15 Pin, straight, headless, ¼ x 1⅝ in.
16 Screw, drive, No. 4 x ¼ in. (2 rqr)

Figure 20. Chemical solution feeder lever arms and push rods, removal, disassembly, reassembly, and installation.

NOTE: REMOVE AND DISASSEMBLE THE OTHER LEVER ARM AND PUSH ROD IN A SIMILAR MANNER.

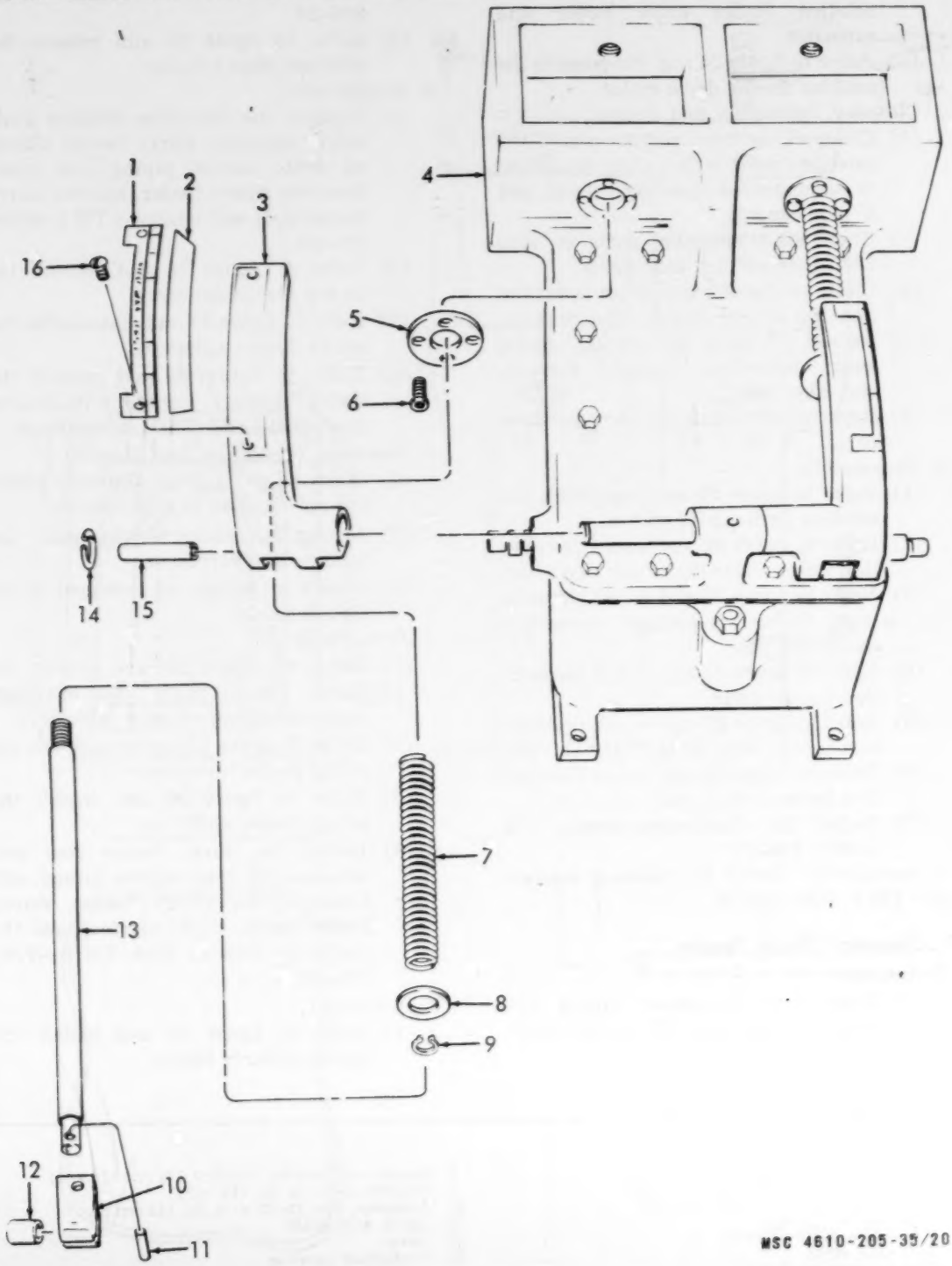


Figure 20—Continued.

(6) Refer to figure 23 and remove the solution feeder drive motor and capacitor.
(7) Refer to figure 24 and disassemble the solution feeder drive motor.

c. Cleaning, Inpsection, and Repair.
(1) Clean all electrical components of the solution feeder with a cloth dampened in an approved cleaning solvent and dry thoroughly.
(2) Clean all nonmetallic parts in soap and water and dry thoroughly.
(3) Clean all metal parts in an approved cleaning solvent and dry thoroughly.
(4) Inspect all parts for cracks, breaks, wear, distortion, damaged threads, and other defects.
(5) Replace all damaged or defective parts.

d. Reassembly.
(1) Refer to figure 24 and reassemble the solution feeder drive motor.
(2) Refer to figure 23 and install the solution feeder drive motor and capacitor.
(3) Refer to figure 22 and install the solution feeder receptacle connector, shaft, and gear.
(4) Refer to figure 21 and install the solution feeder cover.
(5) Refer to figure 20 and install the solution feeder lever arms and push rods.
(6) Refer to figure 19 and install the solution feeder drive arms.
(7) Install the diaphragm pumps TM 5–4610–205–20.

e. Installation. Install the chemical solution feeder TM 5–4610–205–20.

37. Chemical Slurry Feeder

a. Removal.
(1) Remove or disconnect piping and hoses as necessary TM 5–4610–205–20.
(2) Remove the drive chain TM 5–4610–205–20.
(3) Refer to figure 25 and remove the chemical slurry feeder.

b. Disassembly.
(1) Remove the diatomite dilution tank, slurry ejectors, slurry feeder clutch, all drain valves, piping, and hoses from the slurry feeder, and the slurry feeder door and windows TM 5–4610–205–20.
(2) Refer to figure 26 and remove the slurry feeder agitators.
(3) Refer to figure 27 and disassemble the slurry feeder agitators.
(4) Refer to figure 28 and remove the slurry feeder variator indicators, cover plate, and shaft and bearings.

c. Cleaning, Inspection, and Repair.
(1) Wash all parts in an approved cleaning solvent and dry thoroughly.
(2) Inspect for cracks, breaks, wear, distortion, and corrosion.
(3) Repair or replace all damaged or defective parts.

d. Reassembly.
(1) Refer to figure 28 and install the slurry feeder shaft and bearings, cover plate, and variator indicators.
(2) Refer to figure 27 and reassemble the slurry feeder agitators.
(3) Refer to figure 26 and install the slurry feeder agitators.
(4) Install the slurry feeder door and windows, all drain valves, piping, and hoses on the slurry feeder, slurry feeder clutch, slurry ejectors, and the diatomite dilution tank TM 5–4610–205–20.

e. Installation.
(1) Refer to figure 25 and install the chemical slurry feeder.

---

1 Housing
2 Screw, machine, ¼–20 x ⅝ in. (6 rqr)
3 Stud, plain, ⅜–16 x 2¾ in. (2 rqr)
4 Hand wheel (2 rqr)
5 Pin, roll, ⅛ x 1 in. (2 rqr)
6 Retaining strap
7 Clamp assembly (2 rqr)
8 Screw, cap, hex-hd, ¼–20 x 1½ in. (12 rqr)
9 Washer, lock, ¼ in. (12 rqr)
10 Setscrew, No. 10–32 x ¼ in. (12 rqr)
11 Lever arm shaft
12 Cover
13 Preformed packing

Figure 21. Solution feeder cover, removal and installation.

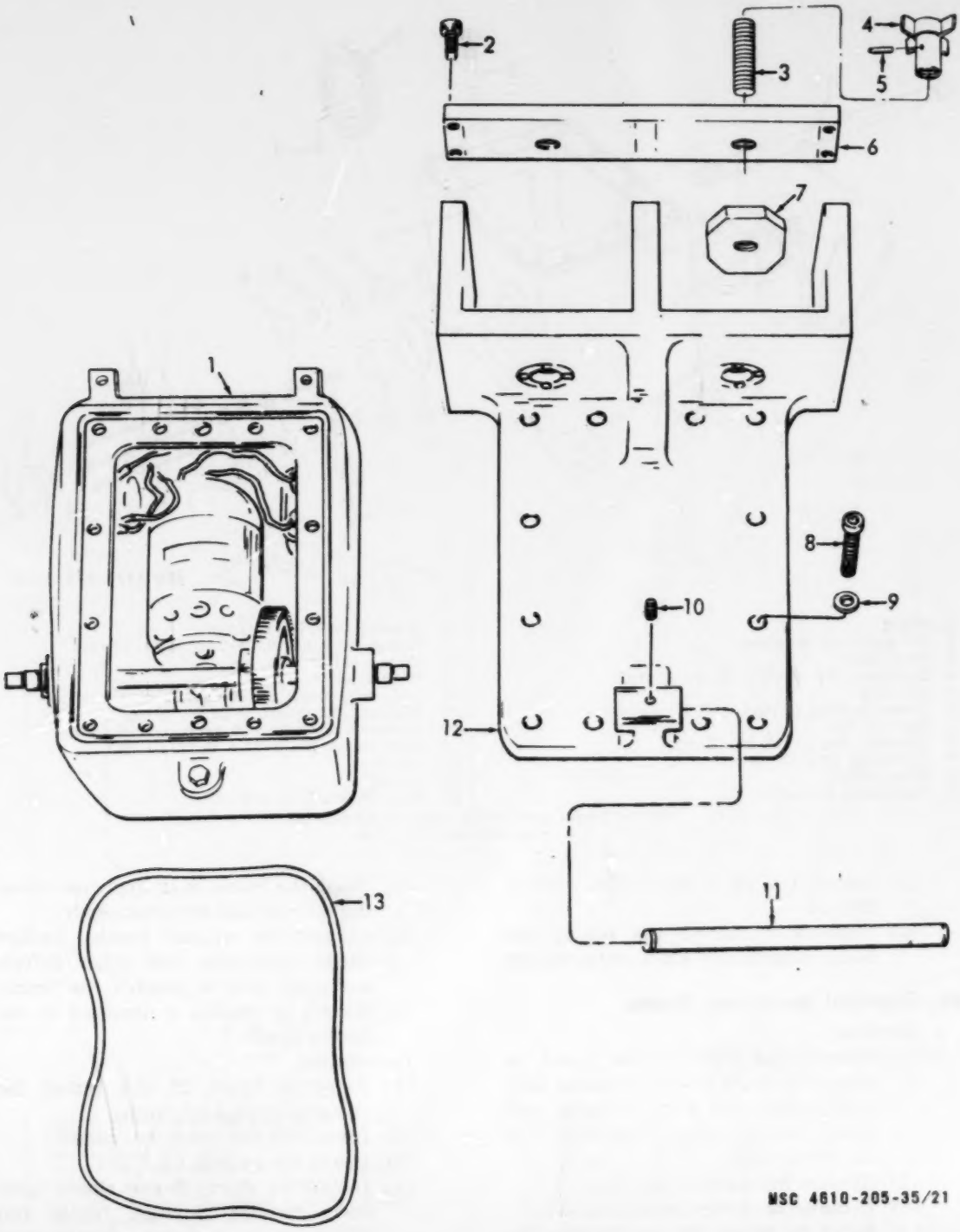
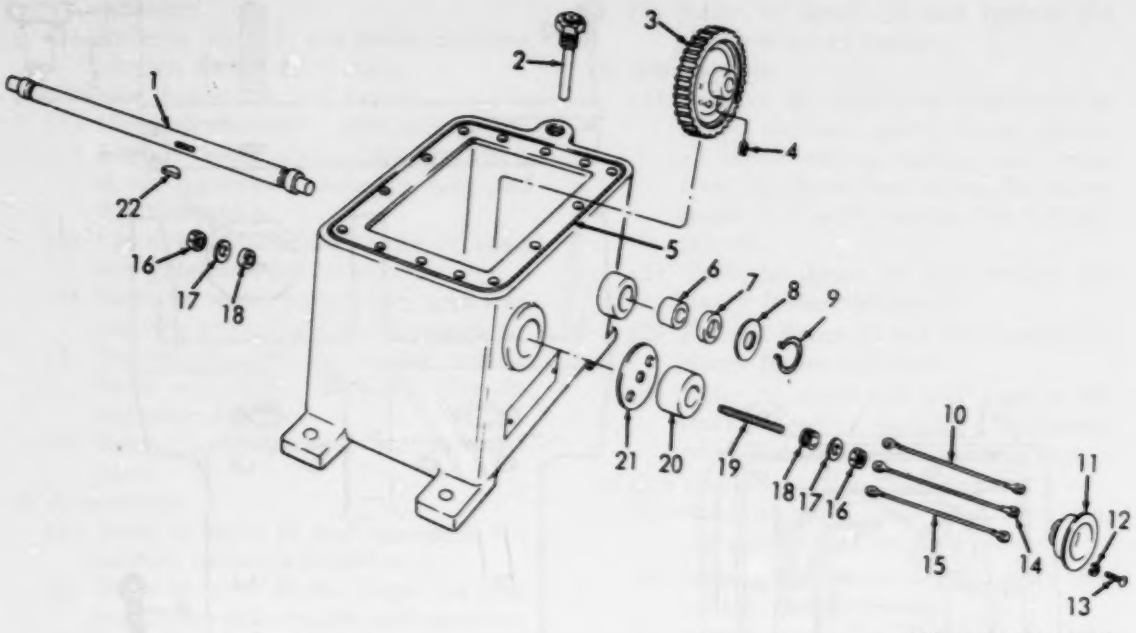


Figure 21—Continued.



1 Shaft
2 Oil gage and breather
3 Spur gear
4 Setscrew, No. 10–32 x ¼ in. (2 rqr)
5 Housing
6 Sleeve bearing (2 rqr)
7 Seal (2 rqr)
8 Washer, flat, 11/16 in. (2 rqr)
9 Retaining ring (2 rqr)
10 Wire (blue)
11 Receptacle connector
12 Washer, lock, No. 6 (2 rqr)
13 Screw, machine, No. 6–32 x ¼ in. (2 rqr)
14 Wire (white)
15 Wire (red)
16 Nut, hex, brass, No. 6–32 (12 rqr)
17 Washer, flat, brass, 5/32 in. (6 rqr)
18 Nonmetallic washer (6 rqr)
19 Stud, brass, No. 6–32 x ¾ in. (3 rqr)
20 Insulator
21 Gasket
22 Key, woodruff, ⅛ x ⅝ in.

Figure 28. Solution feeder gear, shaft, and receptacle connector, removal and installation.

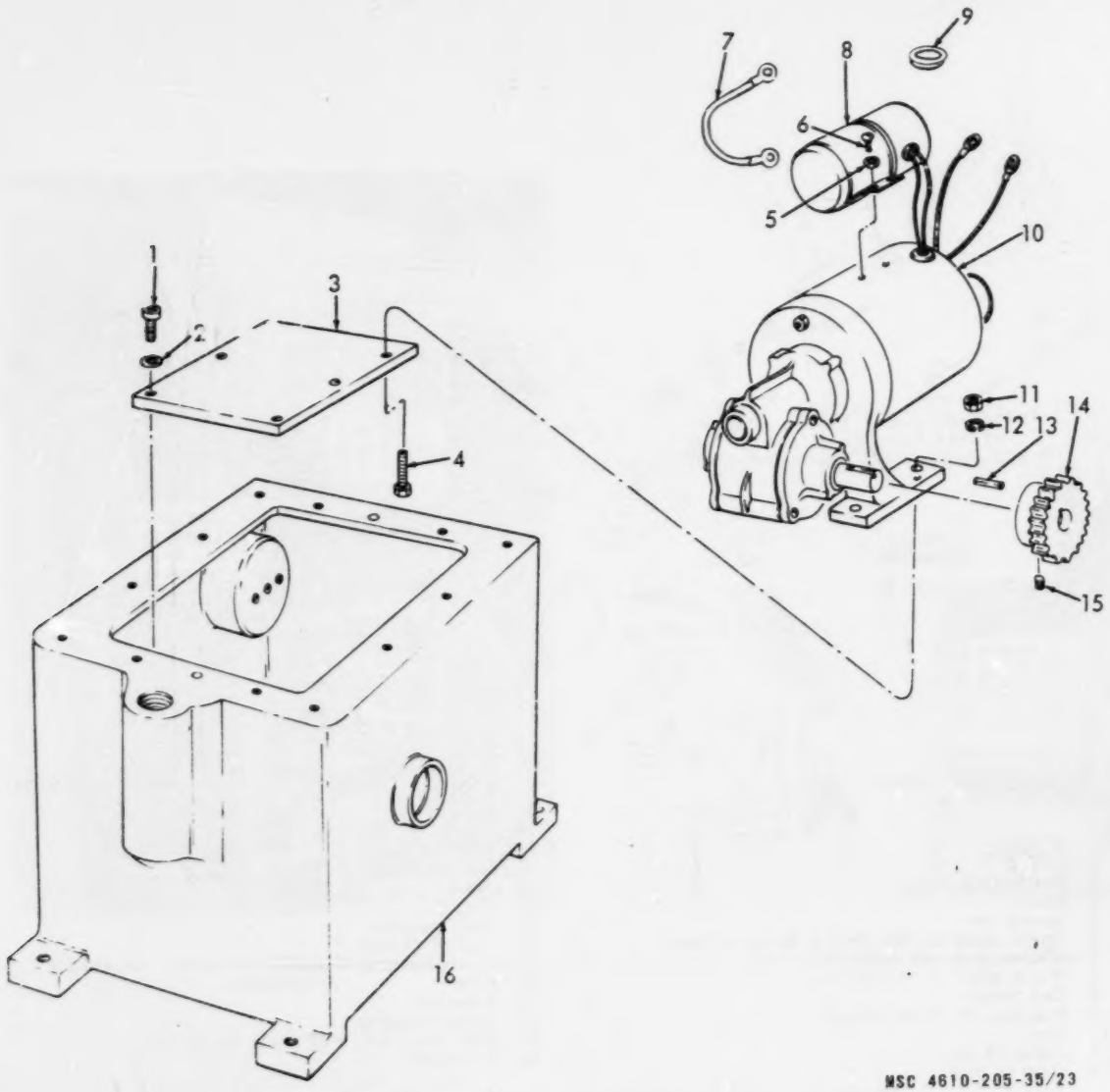
(2) Install the drive chain TM 5–4610–205–20.
(3) Connect or install the piping and hoses as necessary TM 5–4610–205–20.

38. Chemical Equipment Frame

a. Removal.
(1) Remove the slurry feeder speed reducer and drive motor, chemical solution feeder and solution tanks, and slurry feeder chain tightener TM 5–4610–205–20.
(2) Remove the conduit (par. 25).
(3) Remove the slurry feeder (par. 37).
(4) Refer to figure 29 and remove the chemical equipment frame.

b. Cleaning, Inspection, and Repair.
(1) Wash the frame in an approved cleaning solvent and dry thoroughly.
(2) Inspect for cracks, breaks, broken welds, distortion, and other defects that may tend to weaken the frame.
(3) Repair or replace a damaged or defective frame.

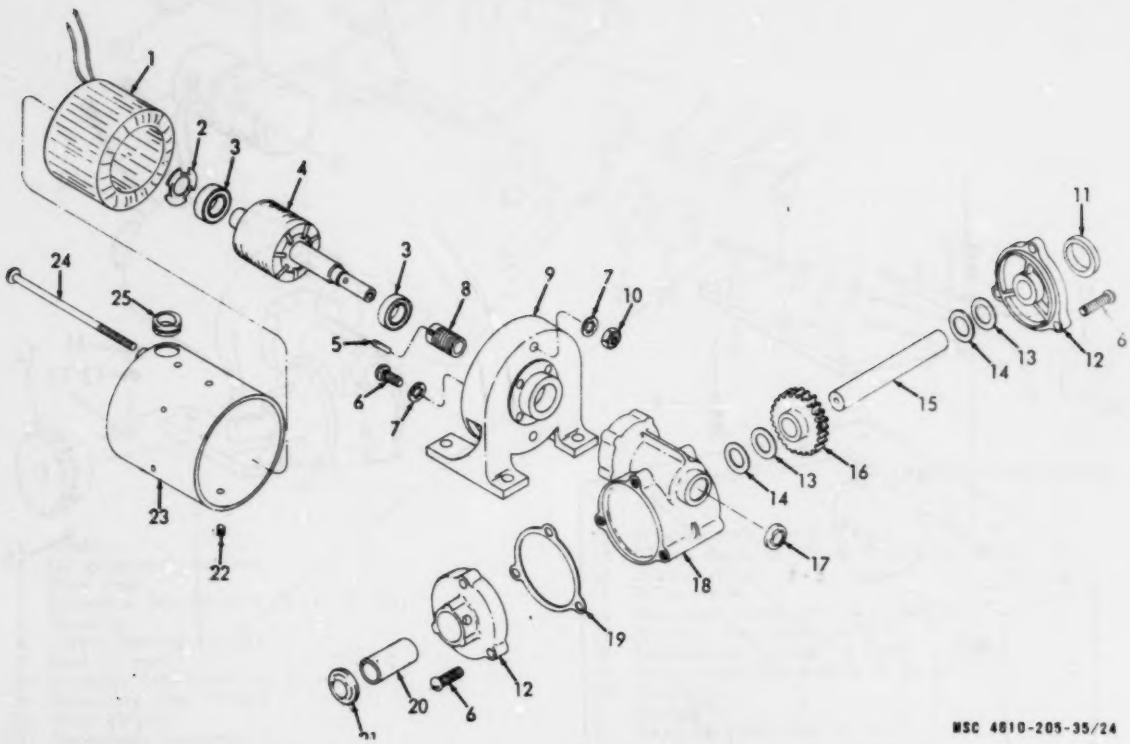
c. Installation.
(1) Refer to figure 29 and install the chemical equipment frame.
(2) Install the slurry feeder (par. 37).
(3) Install the conduit (par. 25).
(4) Install the slurry feeder chain tightener, chemical solution feeder and solution tanks, and slurry feeder speed reducer and drive motor TM 5–4610–205–20.



MSC 4610-205-35/23

1 Screw, cap, hex-hd, ¼–20 x ¼ in. (2 rqr)
2 Washer, lock, ¼ in. (4 rqr)
3 Motor mounting plate
4 Screw, cap, hex-hd, ¼–20 x 1 in. (4 rqr)
5 Washer, lock, IT, No. 10 (2 rqr)
6 Screw, machine, No. 10–24 x ¼ in. (2 rqr)
7 Motor ground wire (white)
8 Capacitor
9 Grommet
10 Drive motor
11 Nut, hex, ¼–20 (2 rqr)
12 Washer, lock, ¼ in. (4 rqr)
13 Key, machine, ⅛ x ⅛ x ¾ in.
14 Motor gear
15 Setscrew, No. 10–32 x ¼ in. (2 rqr)
16 Housing

Figure 23. Solution feeder drive motor and capacitor, removal and installation.



1 Winding
2 Spring
3 Bearing (2 rqr)
4 Rotor
5 Spring pin
6 Screw, machine, No. 8–32 x ½ in. (10 rqr)
7 Washer, lock, No. 8 (6 rqr)
8 Worm gear
9 End frame
10 Nut, hex, No. 8–32 (2 rqr)
11 Seal
12 Cover (2 rqr)
13 Shim (2 rqr)
14 Shim (2 rqr)
15 Countershaft
16 Gear
17 Plug
18 Gear housing
19 Gasket (2 rqr)
20 Sleeve bearing (2 rqr)
21 Plug
22 Setscrew
23 Stator housing
24 Bolt, thru, No. 8–32 x 5¼ in. (2 rqr)
25 Grommet

Figure 24. Solution feeder drive motor, disassembly and reassembly.

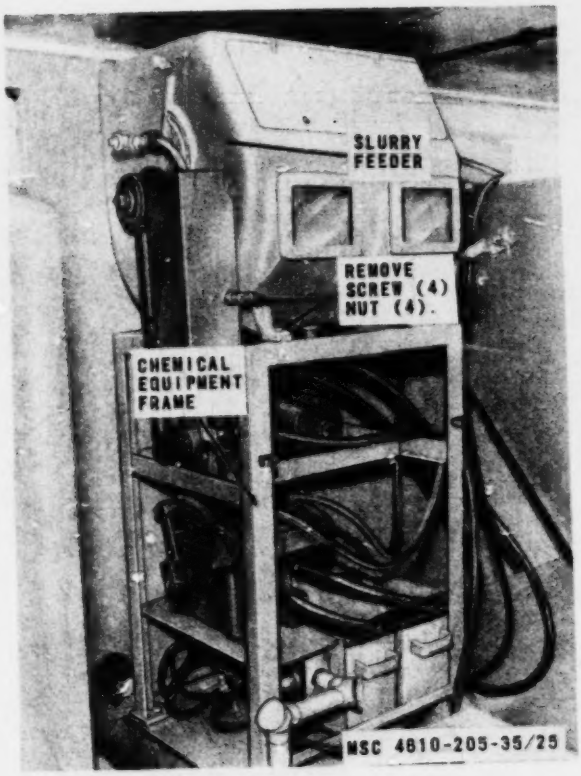


Figure 25. Chemical slurry feeder, removal and installation.

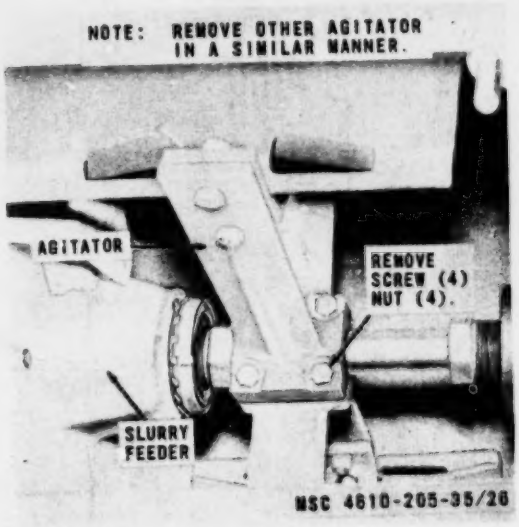
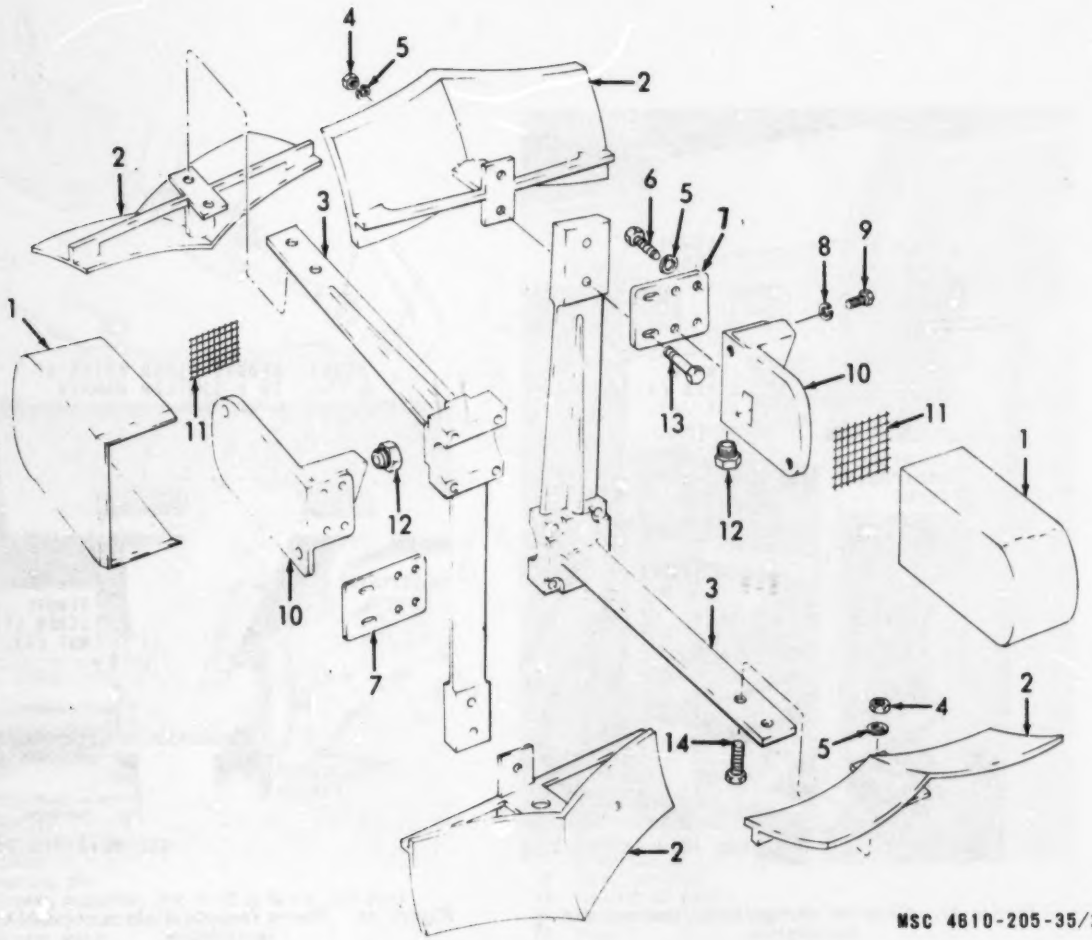
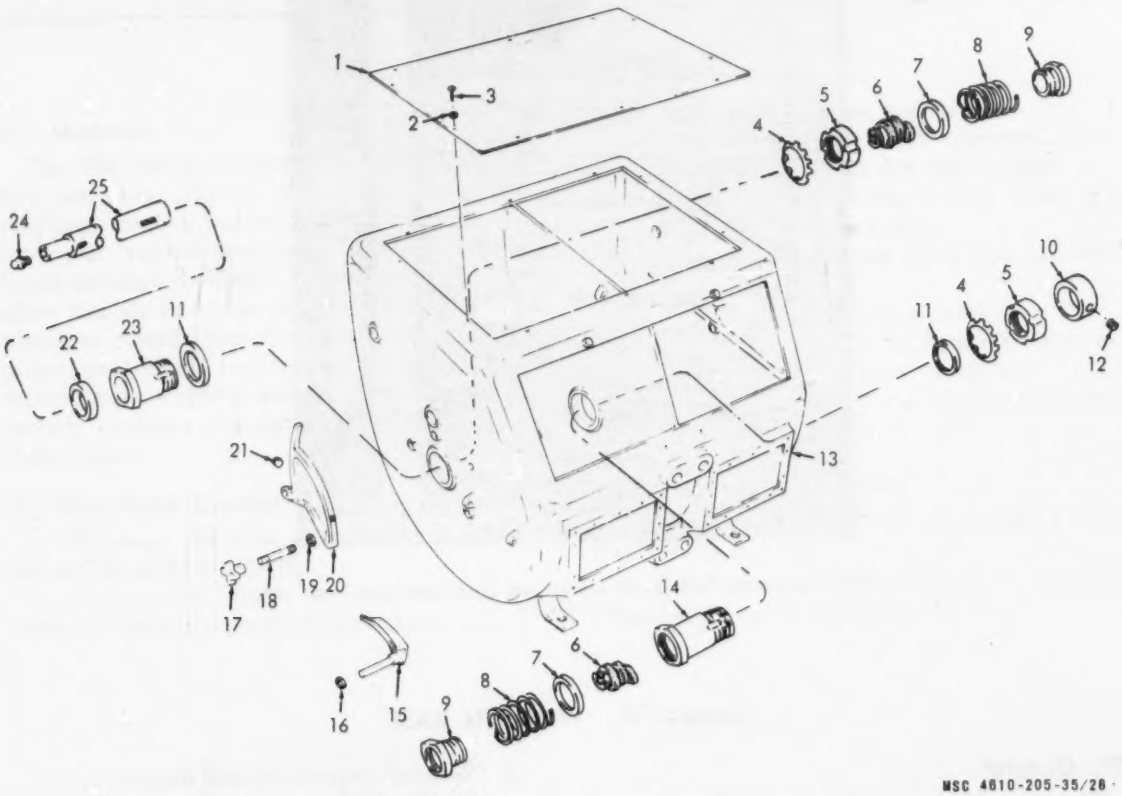


Figure 26. Slurry feeder agitators, removal and installation.



1 Right hand measuring cup (2 rqr)
2 Plow (4 rqr)
3 Arm (2 rqr)
4 Nut, hex, ⅜–16 (8 rqr)
5 Washer, lock, ⅜ in. (10 rqr)
6 Screw, cap, hex-hd, ⅜–16 x ⅞ in. (12 rqr)
7 Steel filler (2 rqr)
8 Washer, lock, ¼ in. (4 rqr)
9 Screw, cap, hex-hd, ¼–20 x ⅝ in. (4 rqr)
10 Measuring cup cover (2 rqr)
11 Screen (2 rqr)
12 Orifice plug (2 rqr)
13 Screw, cap, hex-hd, ⅜–16 x 1½ in. (4 rqr)
14 Screw, cap, hex-hd, ⅜–16 x 1¾ in. (4 rqr)

Figure 27. Slurry feeder agitators, disassembly and reassembly.



1 Cover plate
2 Washer, lock, 7/32 in. (10 rqr)
3 Screw, machine, No. 12–24 x ½ in. (10 rqr)
4 Washer, lock, ET, (spec) (2 rqr)
5 Locknut (2 rqr)
6 Packing (2 rqr)
7 Washer (spec) (2 rqr)
8 Spring (2 rqr)
9 Packing nut (2 rqr)
10 Collar
11 Preformed packing (2 rqr)
12 Setscrew
13 Slurry feeder housing
14 Inner bearing
15 Flow adjustment cover (2 rqr)
16 Seal (2 rqr)
17 Handwheel (2 rqr)
18 Stud, plain, ⅜–16 x 1½ in. (2 rqr)
19 Washer, flat, ⅜ in. (2 rqr)
20 Variator indicator (2 rqr)
21 Setscrew
22 Fiber washer
23 Outer bearing
24 Lubrication fitting
25 Shaft

Figure 28. Slurry feeder variator indicators, cover plate, and shaft and bearings, removal and installation.

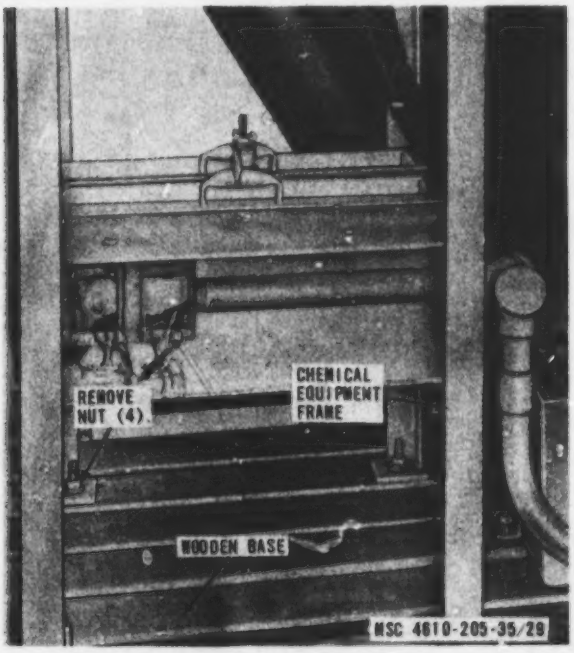


Figure 29. Chemical equipment frame, removal and installation.

Section IV. WOODEN BASE

39. General

The components of the water purification unit are mounted on two separate wooden bases. This section contains maintenance information on the wooden base on which the components of the water treatment section are mounted.

40. Treatment Section Wooden Base

a. Removal.

(1) Remove the waste tank TM 5–4610–205–20.

(2) Remove the chemical equipment frame (par. 38).

(3) Remove the erdlator tank (par. 33).

b. Cleaning, Inspection, and Repair.

(1) Clean the wooden base with water and allow it to dry.

(2) Inspect for cracks, breaks, loose members, and water damage.

(3) Replace all damaged members. Replace a wooden base that is beyond repair.

c. Installation.

(1) Install the erdlator tank (par. 33).

(2) Install the chemical equipment frame (par. 38).

(3) Install the waste tank TM 5–4610–205–20.

CHAPTER 4

FILTER SECTION MAINTENANCE INSTRUCTIONS

Section I. VALVES

41. General

The filter section is equipped with adjustable flow controller valves, air release valves, and plug-type control valves. The adjustable flow controller valves provide a constant flow of water through the filters. The air release valves allow the air to be suddenly released from the filters to knock loose the filter cake, and the plug-type control valves provide a means of directing the water to and from the filters. This section contains maintenance information on these valves.

42. Plug-Type Control Valves

a. Removal. Remove the plug-type control valves TM 5–4610–205–20.

b. Disassembly. Refer to figure 30 and disassemble the plug-type control valves.

c. Cleaning, Inspection, and Repair.

(1) Wash all parts in an approved cleaning solvent and dry thoroughly.

(2) Inspect for cracks, breaks, wear, distortion, and corrosion.

(3) Inspect the check valve seat for wear or damage.

(4) Replace all defective parts.

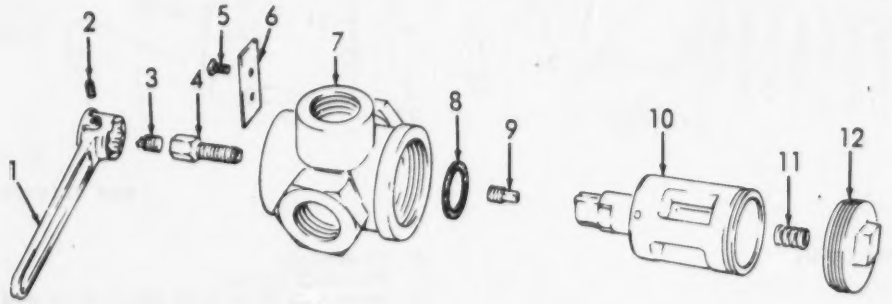
d. Reassembly. Refer to figure 30 and reassemble the plug-type control valves.

e. Installation. Install the plug-type control valves TM 5–4610–205–20.

43. Controller Valves

a. Removal. Remove the controller valves TM 5–4610–205–20.

b. Disassembly. Refer to figure 31 and disassemble the controller valves.



MSC 4610-205-35/30

1 Wrench
2 Setscrew, sq hd, ¼–20 x ¾ in.
3 Slotted plug, ¼–18
4 Lubricating screw
5 Screw, drive, No. 2 x 3/16 in. (2 rqr)
6 Plate
7 Body
8 Spacer
9 Check valve
10 Center plug
11 Spring
12 Base plate

Figure 30. Plug-type control valves, disassembly and reassembly.

c. Cleaning, Inspection, and Repair.

(1) Clean all metal parts in an approved cleaning solvent and dry thoroughly.

(2) Clean the diaphragm in alcohol or nonmineral cleaning solvent.

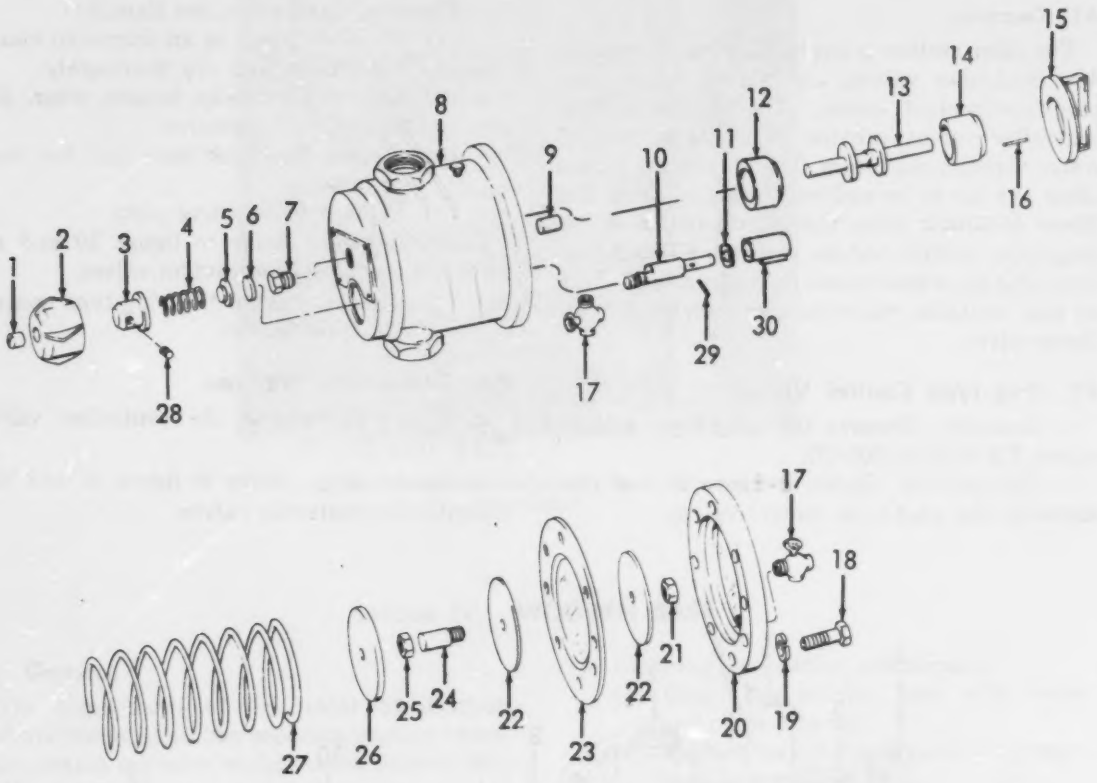
(3) Inspect the diaphragm for cracks, breaks, and deterioration.

(4) Inspect the shaft and stem for misalinement.

(5) Inspect all parts for cracks, breaks, distortion, and wear.

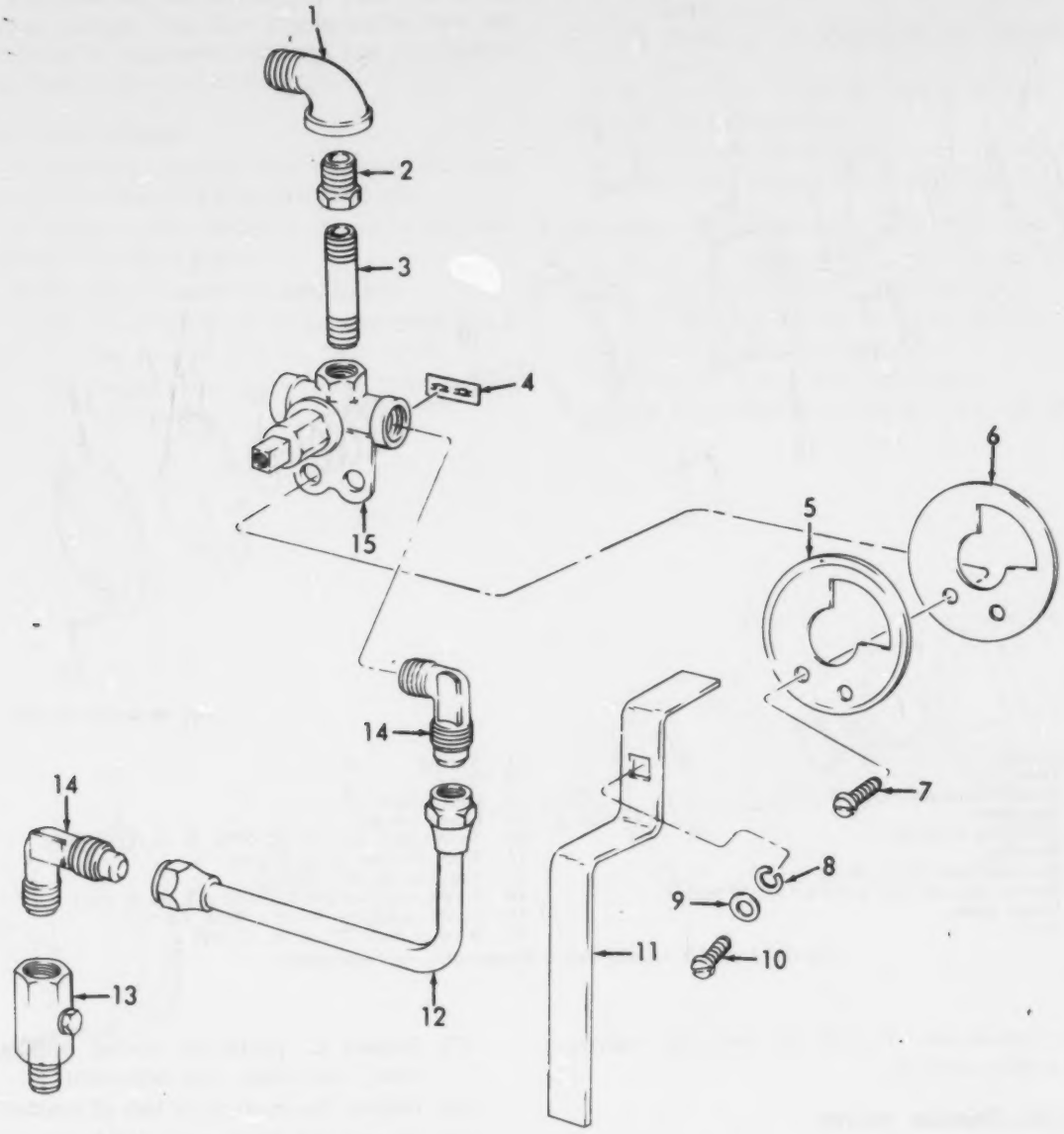
(6) Replace all defective parts.

d. Reassembly. Refer to figure 31 and reassemble the controller valves.



1 Nut, slotted (spec)
2 Knob
3 Pointer
4 Spring
5 Packing gland
6 Packing
7 Plug, pipe, brass, ⅛–27
8 Body
9 Sleeve
10 Shaft
11 Washer, flat, 15/16 in.
12 Orifice
13 Disk and stem assembly
14 Orifice
15 Valve seat
16 Grooved pin
17 Draincock (3 rqr)
18 Screw, cap, fil hd, 5/16–18 x 1 in. (8 rqr)
19 Washer, lock, 5/16 in. (8 rqr)
20 Cover
21 Nut, self-locking, No. 10–32 (2 rqr)
22 Backing plate (2 rqr)
23 Diaphragm
24 Guide pin (2 rqr)
25 Nut, hex, 5/16–18
26 Spring seat
27 Spring
28 Setscrew, ¼–20 x ¼ in.
29 Grooved pin
30 Gate

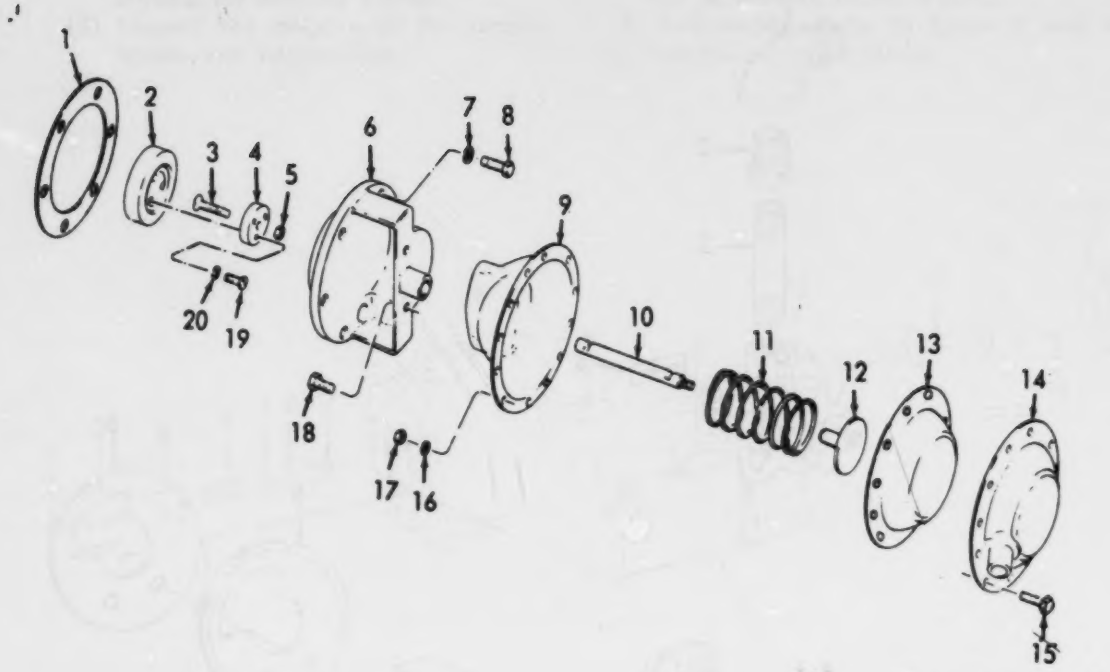
Figure 31. Controller valves, disassembly and reassembly.



EMC 4610-204-35/40

1 Elbow
2 Bushing, pipe, ¼–18 x ⅛–27
3 Nipple, pipe, ⅛–27 x 1½ in.
4 Nut, spring No. 10
5 Nameplate
6 Backing plate
7 Screw, machine, No. 10–24 x ½ in. (2 rqr)
8 Washer, lock, No. 6
9 Washer, flat, No. 6
10 Screw, machine, No. 6–32 x ⅜ in.
11 Lever
12 Tube
13 Check valve
14 Elbow (2 rqr)
15 Three-way valve

Figure 32. Air release valve, three-way valve, disassembly and reassembly.



1 Gasket
2 Disk
3 Screw, machine, 5/16–18 x 2 in.
4 Retainer
5 Nut, hex, 5/16–18
6 Housing
7 Washer, lock, ⅜ in. (6 rqr)
8 Screw, cap, hex hd, ⅜–16 x 1 in. (6 rqr)
9 Lower plate
10 Rod
11 Spring
12 Head
13 Diaphragm
14 Upper plate
15 Screw, cap, hex-hd, ¼–28 x ¾ in. (12 rqr)
16 Washer, lock, ¼ in. (12 rqr)
17 Nut, hex, ¼–28 (12 rqr)
18 Screw, cap, hex hd, 7/16–14 x ¾ in. (2 rqr)
19 Screw, machine, ¼–20 x ⅝ in. (3 rqr)
20 Washer, lock, IT, ¼ in. (3 rqr)

Figure 33. Air release valve, disassembly and reassembly.

e. Installation. Install the controller valves TM 5–4610–205–20.

44. Air Release Valves

a. Removal. Remove the air release valves TM 5–4610–205–20.

b. Disassembly. Refer to figures 32 and 33 and disassemble the air release valves.

c. Cleaning, Inspection, and Repair.

(1) Clean all metal parts in an approved cleaning solvent and dry thoroughly.

(2) Clean the diaphragm in alcohol or nonmineral cleaning solvent.

(3) Inspect all parts for cracks, breaks, wear, distortion, and corrosion.

(4) Inspect the spring for loss of tension.

(5) Inspect the diaphragm for holes and deterioration.

(6) Inspect the rubber seat on the disk for evidence of wear.

(7) Replace all defective parts.

d. Reassembly. Refer to figures 32 and 33 and reassemble the air release valve.

e. Installation. Install the air release valves TM 5–4610–205–20.

Section II. FILTER PUMPS AND MOTORS AND WOODEN BASE

45. General

The filter section is equipped with two motor driven pumps. The filter pumps and motors are enclosed in separate housings but are bolted together to form a single unit.

46. Filter Pumps

a. Removal. Remove and separate the filter pumps and motors TM 5–4610–205–20.

b. Disassembly. Refer to figure 34 and disassemble the filter pumps.

c. Cleaning, Inspection, and Repair.

(1) Wash all parts in an approved cleaning solvent and dry thoroughly.

(2) Inspect for wear, distortion, cracks, and breaks.

(3) Inspect the seal assembly for a weakened spring and damaged seating surface.

(4) Replace all damaged or defective parts.

d. Reassembly. Refer to figure 34 and reassemble the filter pumps.

e. Installation. Reassemble and install the filter pumps and motors TM 5–4610–205–20.

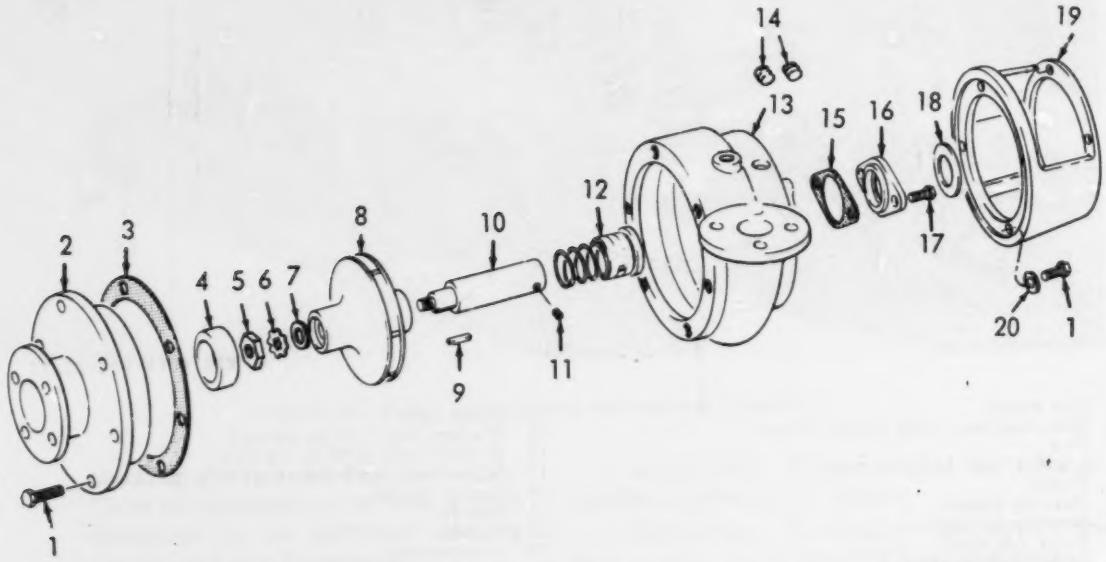
47. Filter Pump Motors

a. Removal. Remove and separate the filter pumps and motors TM 5–4610–205–20.

b. Disassembly. Refer to figure 35 and disassemble the filter pump motors.

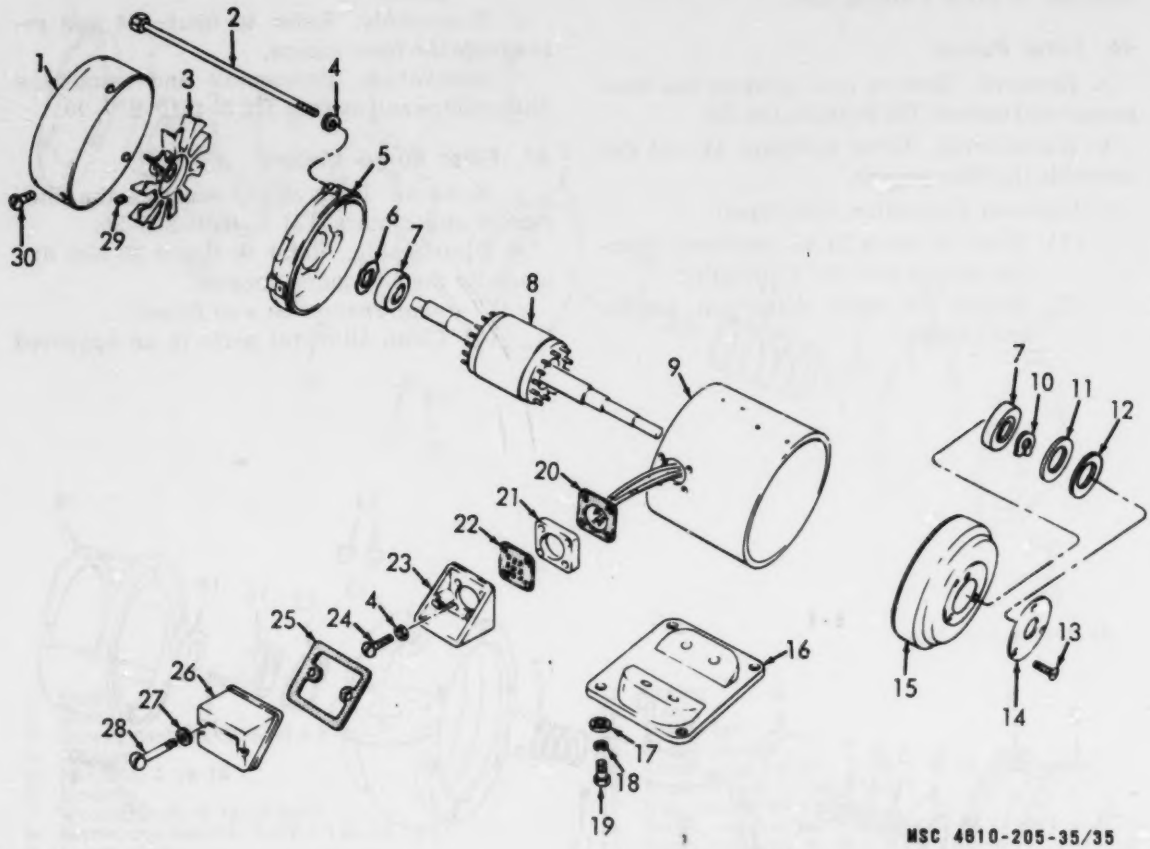
c. Cleaning, Inspection, and Repair.

(1) Clean all metal parts in an approved



1 Screw, cap, hex-hd, ⅜–16 x ⅞ in. (14 rqr)
2 Suction head
3 Gasket
4 Wear ring
5 Locknut
6 Washer, lock, IET, (spec)
7 Washer, flat, (spec)
8 Impeller
9 Key, machine, 3/16 x 3/16 x 1½ in.
10 Impeller shaft
11 Setscrew
12 Pump seal assembly
13 Pump casing
14 Plug, pipe, ¼ in. (2 rqr)
15 Gasket
16 Gland
17 Screw, cap, hex-hd, 5/16–18 x ¾ in. (2 rqr)
18 Deflector
19 Adapter
20 Washer, flat, ⅜ in. (14 rqr)

Figure 34. Filter pump, disassembly and reassembly.



1 Fan guard	16 Motor base
2 Bolt, machine, ¼–20 x 9 in. (4 rqr)	17 Washer, flat, 5/16 in. (4 rqr)
3 Fan	18 Washer, lock, 5/16 in. (4 rqr)
4 Washer, lock, ¼ in. (8 rqr)	19 Screw, cap, hex-hd, 5/16–24 x ⅞ in. (4 rqr)
5 Shield	20 Spacer gasket
6 Bearing spacer	21 Spacer
7 Bearing (2 rqr)	22 Gasket
8 Rotor and shaft	23 Junction box
9 Stator and housing	24 Screw, machine, ¼–20 x 1 in. (4 rqr)
10 Retaining ring	25 Gasket
11 Shim	26 Junction box cover
12 Shim	27 Washer, flat, brass, ¼ in. (2 rqr)
13 Screw, machine, No. 10–32 x ⅜ in. (3 rqr)	28 Screw, machine, ¼–20 x ½ in. (2 rqr)
14 Bearing plate	29 Screw, cap, hex-hd, ¼–20 x ⅜ in. (3 rqr)
15 Shield	30 Setscrew, ¼–20 x ⅜ in.

Figure 35. Filter pump motors, disassembly and reassembly.

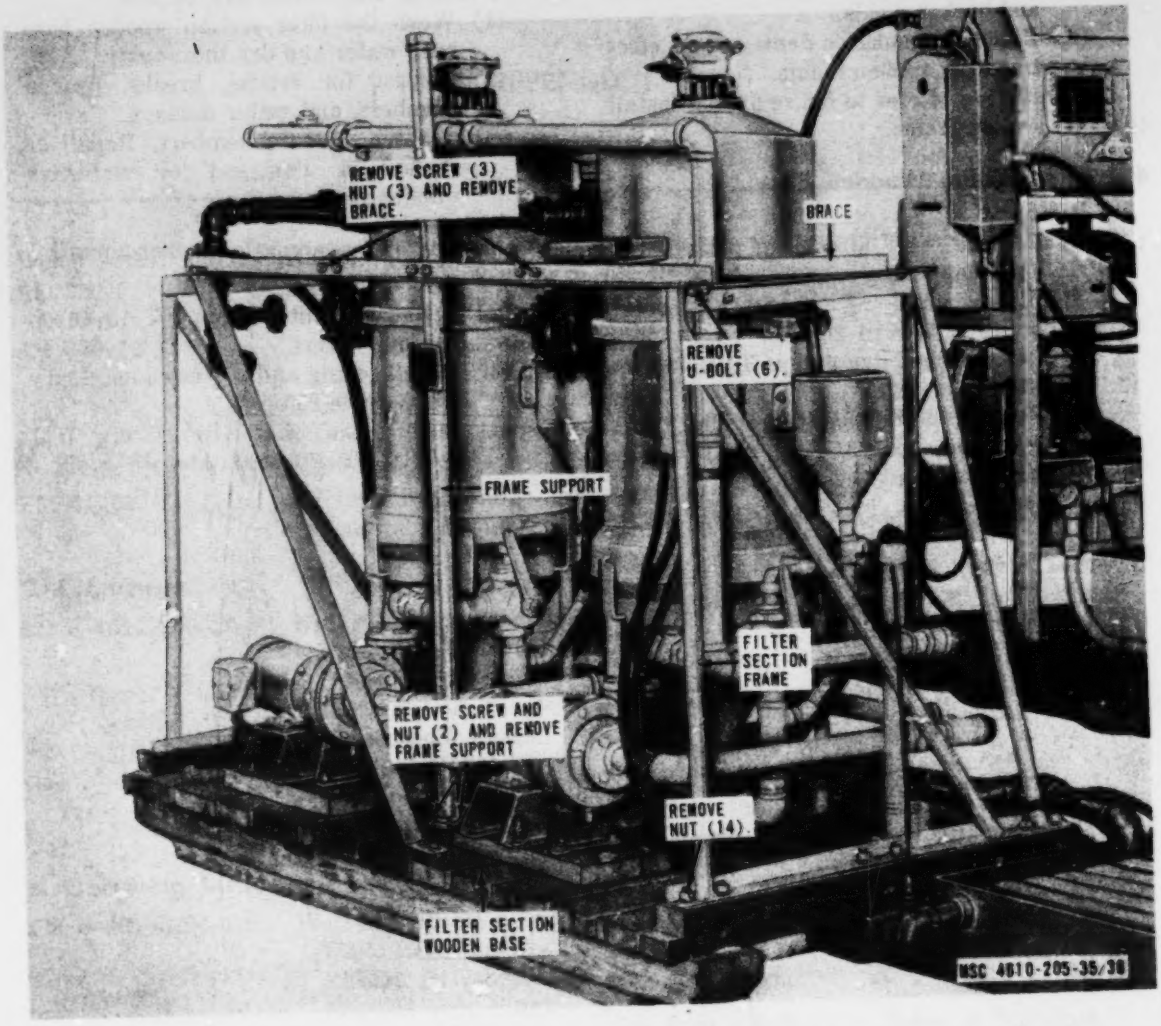


Figure 36. Filter section frame, removal and installation.

cleaning solvent and dry thoroughly. Clean all nonmetal parts with a cloth dampened in an approved cleaning solvent and dry thoroughly.

(2) Inspect all parts for cracks, breaks, distortion, and wear.

(3) Inspect the bearings for freedom of movement and other damage.

(4) Inspect all wiring for damaged insulation.

(5) Replace all defective parts.

d. Testing. Refer to TM 5–764 and test the filter motor.

e. Reassembly. Refer to figure 35 and reassemble the filter pump motors.

f. Installation. Reassemble and install the filter pumps and motors TM 5–4610–205–20.

48. Filter Section Frame

a. Removal. Refer to figure 36 and remove the filter section frame.

b. Cleaning, Inspection, and Repair.

(1) Wash the filter section frame in an approved cleaning solvent and dry thoroughly.

(2) Inspect for cracks, breaks, distortion, and broken welds.
(3) Repair or replace a damaged or defective filter section frame.

c. Installation. Refer to figure 36 and install the filter section frame.

49. Filter Section Wooden Base

a. Removal.
(1) Remove the diatomite filters TM 5–4610–205–20.
(2) Remove all piping and valves as necessary TM 5–4610–205–20.
(3) Remove the filter pumps TM 5–4610–205–20.
(4) Remove the filter section frame (par. 48).

b. Cleaning, Inspection, and Repair.
(1) Wash the filter section wooden base with water and dry thoroughly.
(2) Inspect for cracks, breaks, broken members, and water damage.
(3) Tighten all loose members. Repair or replace a damaged or defective wooden base.

c. Installation.
(1) Install the filter section frame (par. 48).
(2) Install the filter pumps TM5–4610–205–20.
(3) Install piping and valves as necessary TM 5–4610–205–20.
(4) Install the diatomite filters TM 5–4610–205–20.

APPENDIX I

REFERENCES

1. Dictionaries of Terms and Abbreviations

AR 320–5	Dictionary of United States Army Terms.
AR 320–50	Authorized Abbreviations and Brevity Codes.

2. Field Maintenance

TM 5–764	Electric Motor and Generator Repair.

3. Lubrication

LO 5–4610–205–20	Water Purification Unit: Base Mounted; Electric Driven, Ac, 120/208 Volt, Single Phase and 3 Phase, 60 Cycle; 3000 Gallons Per Hour (Met-Pro Model 3000–2700A).

4. Operating Instructions

TM 5–4610–205–10	Water Purification Unit: Base Mounted; Electric Driven, Ac, 120/208 Volt, Single Phase and 3 Phase, 60 Cycle; 3000 Gallons Per Hour (Met-Pro Model 3000–2700A) FSN 4610–857–0330.

5. Organizational Maintenance

TM 5–4610–205–20	Water Purification Unit: Base Mounted; Electric Driven, Ac, 120/208 Volt, Single Phase and 3 Phase, 60 Cycle; 3000 Gallons Per Hour (Met-Pro Model 3000–2700A) FSN 4610–857–0330.

6. Painting and Preservation

TB ENG 60	Preservation and Painting of Serviceable Corps of Engineer Equipment.

7. Preventive Maintenance

AR 750–5	Organization, Policies, and Responsibilities for Maintenance Operation.
TB ENG 347	Winterization Techniques for Engineer Equipment.
TM 38–750	The Army Equipment Records System and Procedures.

8. Publications Indexes

DA Pam 108–1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.
DA Pam 310–1	Index of Administrative Publications.
DA Pam 310–2	Index of Blank Forms.
DA Pam 310–3	Index of Doctrinal, Training, and Organizational Publications.
DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA Pam 310–5	Index of Graphic Training Aids and Devices.
DA Pam 310–25	Index of Supply Manuals—Corps of Engineers.

9. Supply Publications

TM 5–4610–205–20P	Water Purification Unit: Base Mounted; Electric Driven, Ac, 120/208 Volt, Single Phase and 3 Phase, 60 Cycle; 3000 Gallons Per Hour (Met-Pro Model 3000–2700A) FSN 4610–857–0330.
TM 5–4610–205–35P	Water Purification Unit: Base Mounted; Electric Driven, Ac, 120/208 Volt, Single Phase and 3 Phase, 60 Cycle; 3000 Gallons Per Hour (Met-Pro Model 3000–2700A) FSN 4610–857–0330.

10. Training Aids

FM 21–5	Military Training.
FM 21–6	Techniques of Military Instruction.
FM 21–30	Military Symbols.

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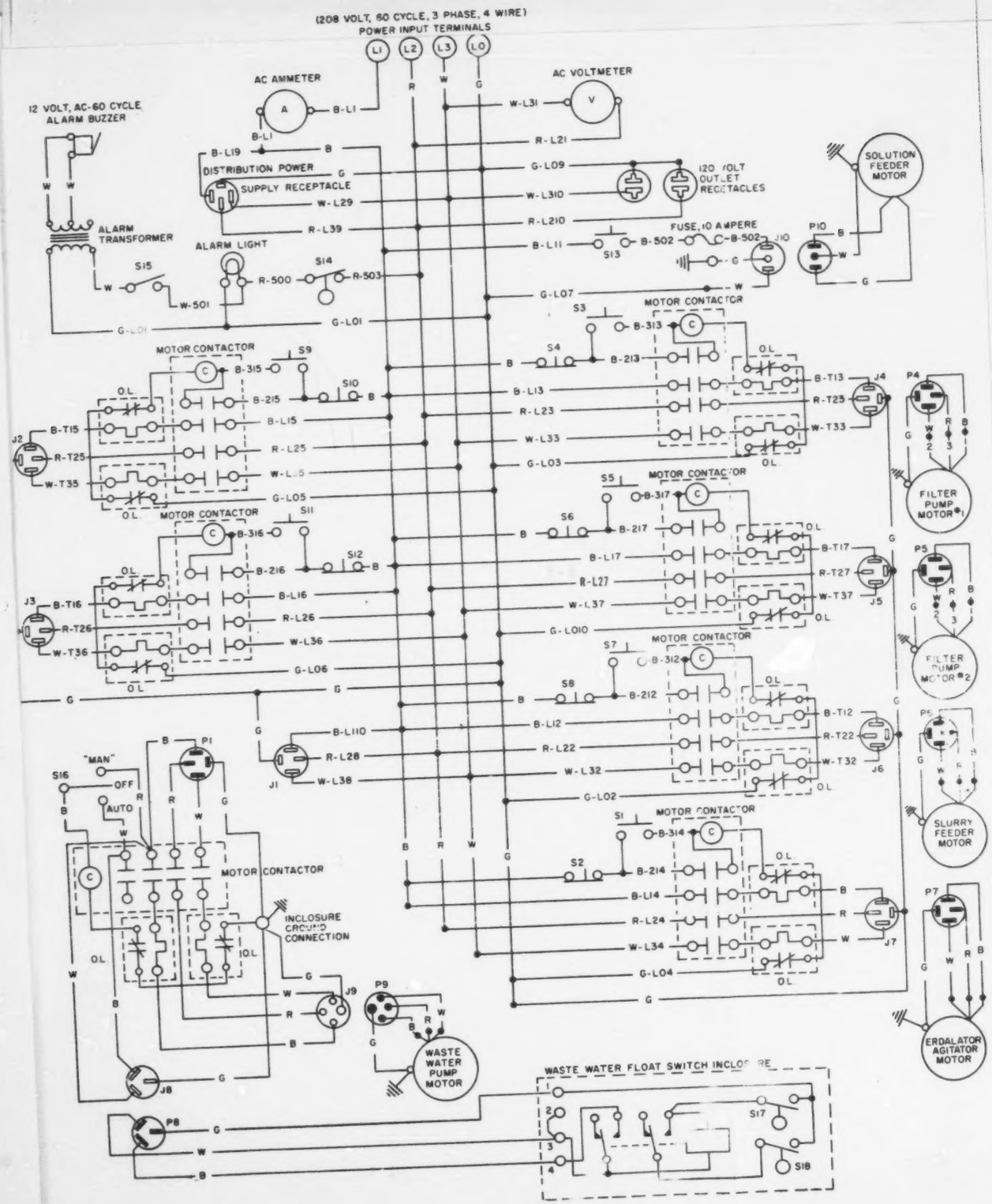
USACOMZEUR (2)
USAREUR Engr Sup Con Agcy (10)
USAREUR Engr Proc Cen (2)
MAAG (1)
JBUSMC (1)
Units org under fol TOE:
5-48 (2)
5-237 (5)
5-262 (5)
5-267 (1)
5-278 (5)
5-279 (2)

NG: State AG (3).
USAR: Same as Active Army except allowance is one copy to each unit.
For explanation of abbreviations used, see AR 320-50.

* U. S. GOVERNMENT PRINTING OFFICE: 1989 -242-451/ 5925 09-30



SYMBOL LEGEND

- CONTACTOR COIL
- NORMALLY OPEN PUSH BUTTON SWITCH
- NORMALLY CLOSED OVERLOAD RELAY CONTACT
- HEATER ELEMENT OVERLOAD RELAY ACTUATING
- THREE POSITION TRANSFER SWITCH
- NORMALLY OPEN CONTACTS
- GROUND
- RELAY OPERATED CONTACTS
- RELAY ACTUATING COIL
- LIQUID LEVEL SWITCH (OPENS ON RISE OF LIQUID)
- SINGLE POLE SINGLE THROW TOGGLE SWITCH
- LIQUID LEVEL SWITCH (CLOSE ON RISE OF LIQUID)

DEVICE LEGEND

J1 RECEPTACLE CONNECTOR (WASTE WATER PUMP TO MOTOR CONTACTOR)
J2 RECEPTACLE CONNECTOR (RAW WATER PUMP #1)
J3 RECEPTACLE CONNECTOR (RAW WATER PUMP #2)
J4 RECEPTACLE CONNECTOR (FILTER PUMP MOTOR #1)
J5 RECEPTACLE CONNECTOR (FILTER PUMP MOTOR #2)
J6 RECEPTACLE CONNECTOR (SLURRY FEEDER MOTOR)
J7 RECEPTACLE CONNECTOR (ERDALATOR AGITATOR MOTOR)
J8 RECEPTACLE CONNECTOR (WASTE WATER MOTOR CONTACTOR TO FLOAT SWITCH)
J9 RECEPTACLE CONNECTOR (WASTE WATER MOTOR CONTACTOR TO MOTOR)
J10 RECEPTACLE CONNECTOR (SOLUTION FEEDER MOTOR)
OL OVERLOAD RELAY
P1 PLUG CONNECTOR (WASTE WATER MOTOR CONTACTOR)
P4 PLUG CONNECTOR (FILTER PUMP MOTOR #1)
P5 PLUG CONNECTOR (FILTER PUMP MOTOR #2)
P6 PLUG CONNECTOR (SLURRY FEEDER MOTOR)
P7 PLUG CONNECTOR (ERDALATOR AGITATOR MOTOR)
P8 PLUG CONNECTOR (WASTE WATER FLOAT SWITCH)
P9 PLUG CONNECTOR (WASTE WATER PUMP MOTOR)
P10 PLUG CONNECTOR (SOLUTION FEEDER MOTOR)
S1 START SWITCH — ERDALATOR AGITATOR MOTOR
S2 STOP SWITCH
S3 START SWITCH — FILTER PUMP MOTOR #1
S4 STOP SWITCH
S5 START SWITCH — FILTER PUMP MOTOR #2
S6 STOP SWITCH
S7 START SWITCH — SLURRY FEEDER MOTOR
S8 STOP SWITCH
S9 START SWITCH — RAW WATER PUMP MOTOR#1
S10 STOP SWITCH
S11 START SWITCH — RAW WATER PUMP MOTOR #2
S12 STOP SWITCH
S13 START SWITCH (SOLUTION FEEDER MOTOR) MECHANICAL RELEASE
S14 WATER LEVEL SENSING SWITCH
S15 ALARM SILENCE SWITCH
S16 WASTE WATER PUMP OPERATION SELECTOR SWITCH
S17 HIGH LEVEL CUT IN SWITCH (WASTE WATER PUMP)
S18 LOW LEVEL CUT OUT SWITCH (WASTE WATER PUMP)

WIRE CODE (COLOR PRECEDES CIRCUIT NO.)

B - BLACK
W - WHITE
G - GREEN
R - RED

MSC 3810-205-35/1

Figure 1

PIN : 027441-000